

TOSHIBA

TOSHIBA Thermal Printer

B-SV4D SERIES

Printer Manual

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(Revised)

This manual includes the contents of the Product Description, Maintenance Manual, and Circuit Description.

PRINTED IN JAPAN

TOSHIBA TEC CORPORATION

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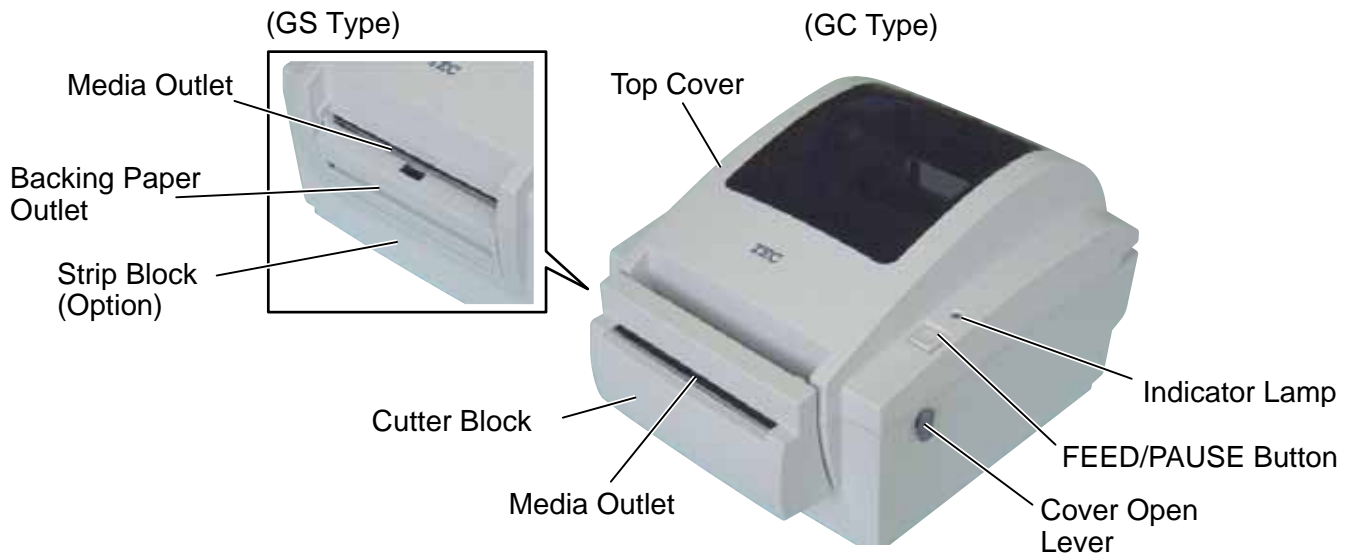
CAUTION!

- 1. This manual may not be copied in whole or in part without prior written permission of TOSHIBA TEC.*
- 2. The contents of this manual may be changed without notification.*
- 3. Please refer to your local Authorised Service representative with regard to any queries you may have in this manual.*

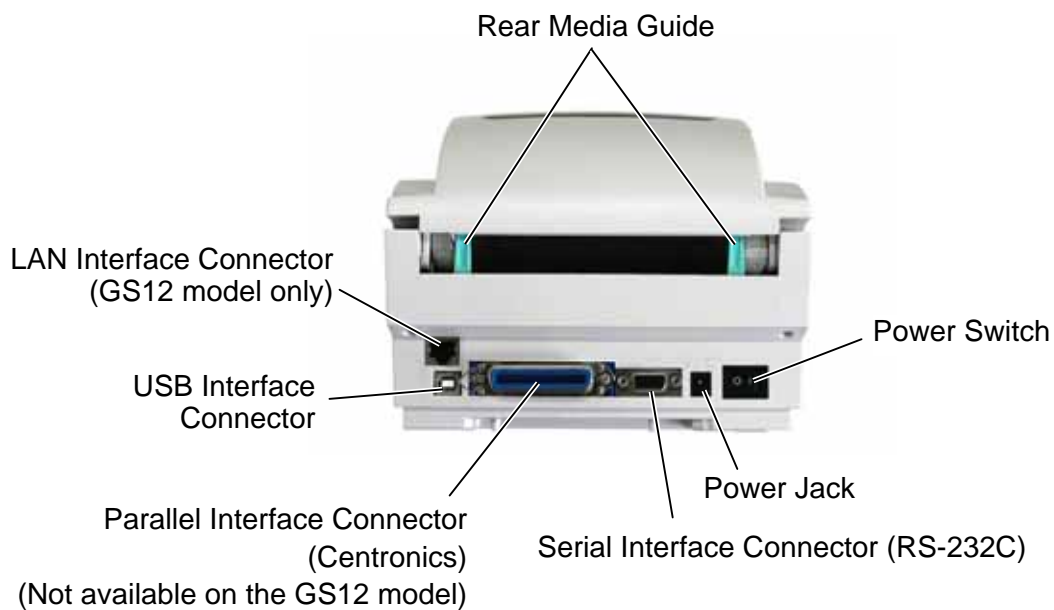
1. OUTLINE

1.1 Features of the B-SV4D

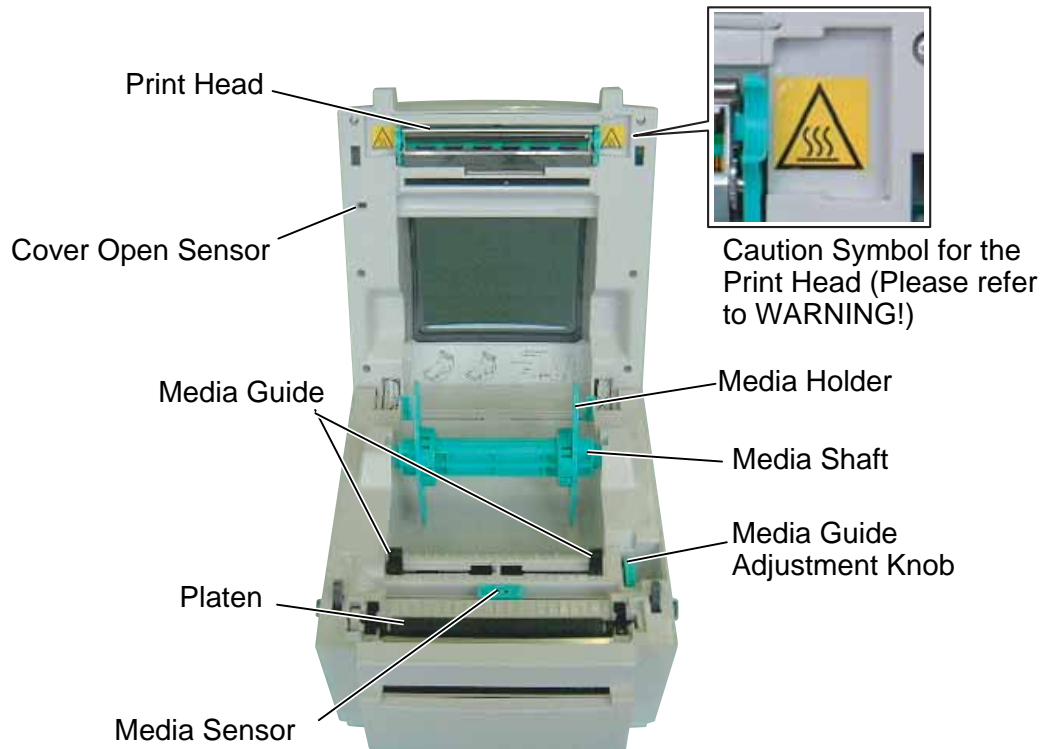
1.1.1 Front View



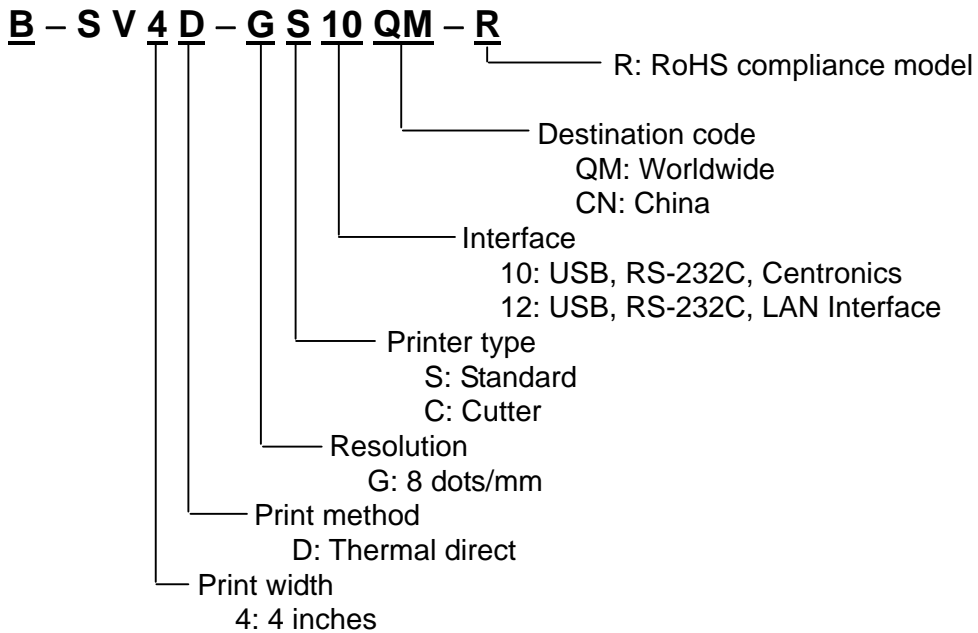
1.1.2 Rear View



1.1.3 Interior View



1.2 Indications in Model No.



1.3 Basic Specifications

(1) Print Method

Thermal Direct Printing

(2) Print Speed

2,3,4 and 5 ips selectable

2,3 ips selectable with peel function

(3) Magnification of Bar Codes

- Code 39
- Code 39C
- Code 93
- Code 128UCC
- Code128 subsets A.B.C
- Code 11
- Codabar
- Interleave 2 of 5
- EAN-8
- EAN-13
- EAN-128
- UPC-A
- UPC-E
- EAN and UPC 2(5) digits add-on
- MSI
- PLESSEY
- POSTNET
- PDF-417
- Maxicode
- DataMatrix
- MacroPDF-417
- QR code

1.4 Electronics Specifications

(1) CPU

HITACHI SH2

(2) CPLD

72 macrocells with 1600 usable gates.

(3) Memory

On-board flash ROM : 1024K bytes and can up to 2048K byte

DRAM : 2M bytes

(4) Memory Card

A 1MB, 2MB, 3MB, 4MB, 6MB, or 8MB memory module can be installed as an optional expansion memory.

(5) Interface

RS-232 interface

USB interface (V1.1)

Parallel interface : SPP, ECP mode

2. SUPPLY SPECIFICATIONS

2.1 Label/Tag Size and Shape

Item	Specification
Type	Label (Continuous, die-cut, fan-fold with guide)
Label Width	25.4~112 mm (1.0"~4.4")
Label Length	10~609.6 mm (0.4"~24.0")
Label Thickness	0.06~0.19 mm
Label Roll Diameter	5.0" (inside printer), 8.4" (outside label hanger)
Roll Core Diameter	25.4 mm or 76.2 mm (1.0"~3.0")
Black Mark Width	8 mm (Min.)
Black Mark Height	2 mm (Min.)

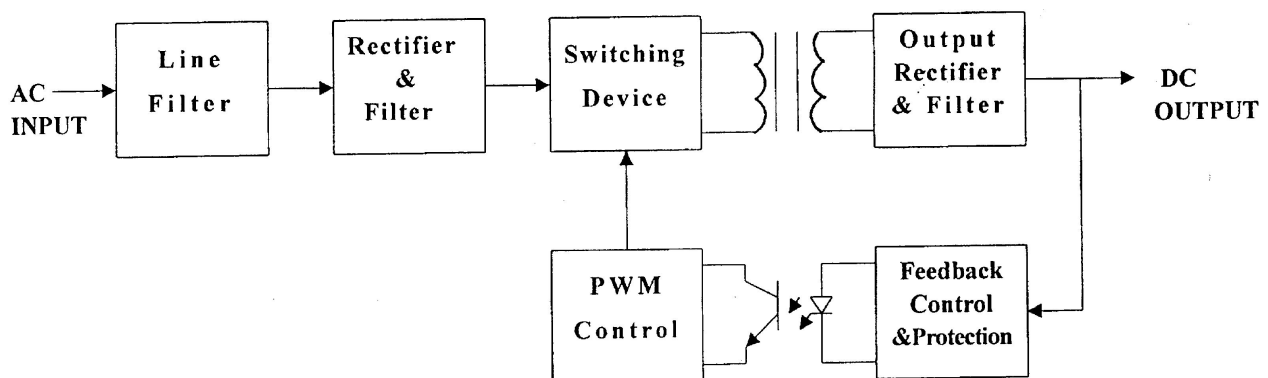
3. ELECTRONICS

3.1 Outline of the PC Board

The electrical part of this printer is comprised of the Main PC Board, the Print Head, Motors, and Sensors. The Main PC Board controls the electrical part. Power is supplied from the AC Adapter externally attached. Optional devices including the Memory Module and the Cutter are present.

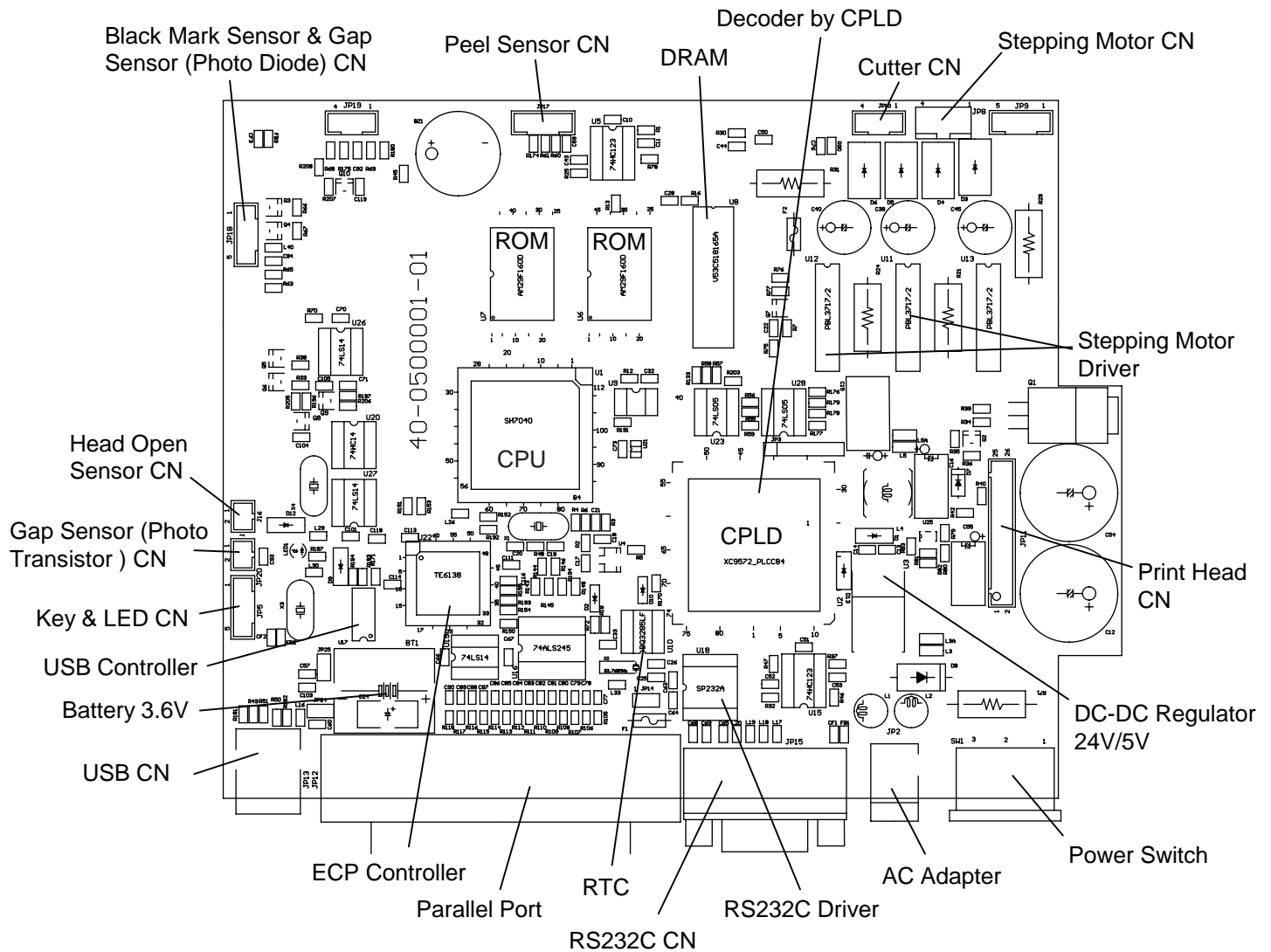
3.2 AC Adapter (Switching Power Supply)

This unit generates the printer operating voltage of 24V from the AC power supply (100V to 240V). The Power Cord is connected to 100VAC to 240VAC is input. This unit rectifies, removes noises.

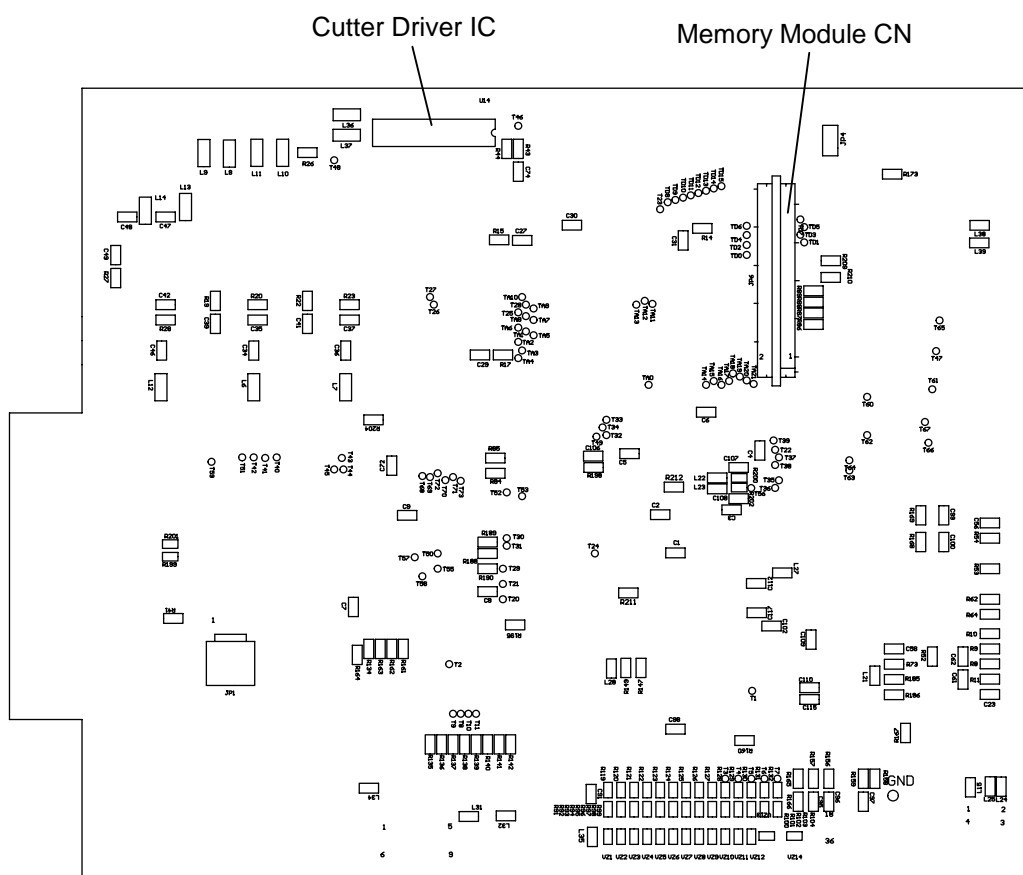


3.3 Main PC Board

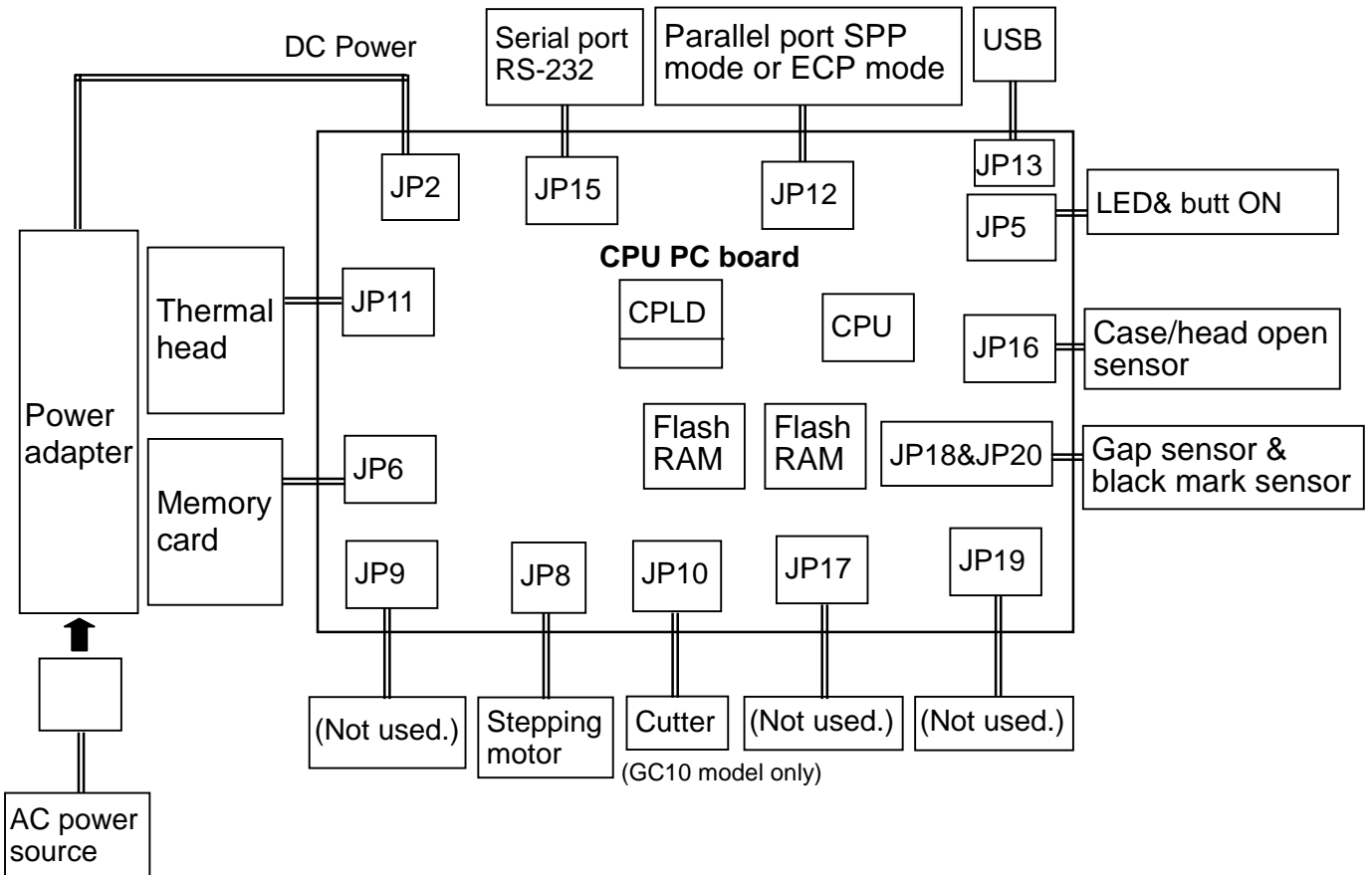
PCB Layout (Parts side)



PCB Layout (Soldering side)

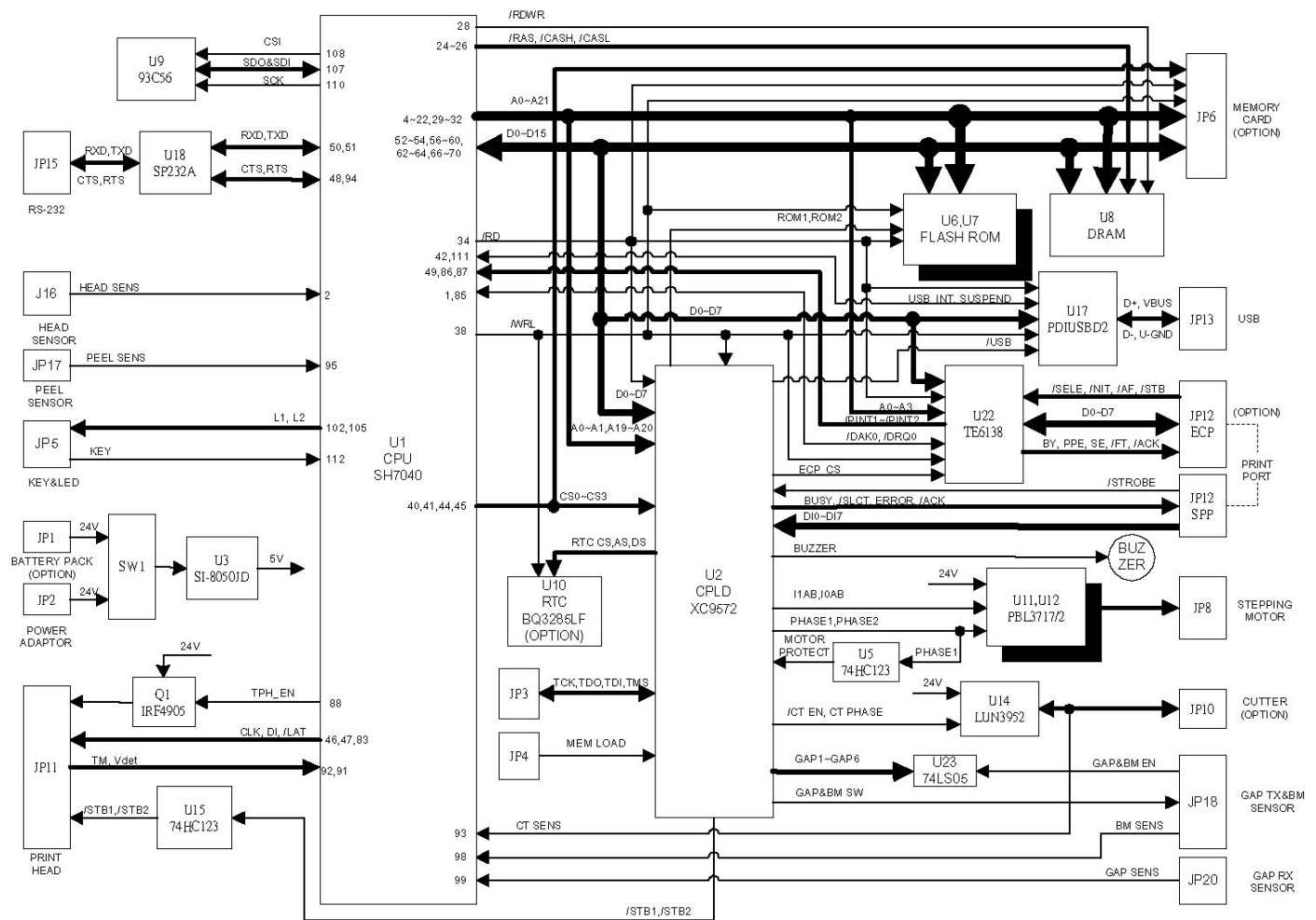


Wiring Diagram



NOTE: JP indicates a connector. Regarding the connector locations, refer to Section 4.3, Replacing the Top Cover, Lower Cover, and Main PC Board.

Block Diagram



Reset Circuit

The S-80845 IC Voltage Detector can detect the voltage while RC is charging. And outputs the system reset signal of “LOW” when the driving voltage is lower than 4.5Vdc (Typical).

Memory Circuit

There are 2MB DRAM and 2MB Flash ROM built on the Main PC Board. This is the memory circuit. The U6&U7 type 1M Byte Flash ROM and U8 type 2M Byte DRAM are used. The MCU R/W pin becomes “H” when reading Flash ROM or DRAM, and “L” when writing. JP6 is memory card connector, and it can expand to 8MB.

Print Head Circuit

CLK and /LAT connected to Thermal Head control clock and data latch respectively.

The TPH_EN signal controls the DC24V voltage of the Thermal Head. When TPH_EN is “High”, the Thermal Head will be separated from 24V (V_{DD}). U21 controls protecting Print Head. It is used to make sure the power of Print Head is off when turning off the printer. And the Q1 and Q2 are used to limit current of Print Head.

The /STB1 and /STB2 determines whether to heat the Thermal Head or not. The RC charging time of U15 and 74HC123 limit the heating time of Print Head to avoid burning the Print Head.

The DI signal sends the printer data to the Print Head.

The TM signal is the temperature/voltage sensor for Thermal Head.

The Vdet feeds back the voltage and compensates the heat time for voltage accuracy when printing.

Stepping Motor Drive/ Protection Circuit

Connector JP8 sends the pattern as shown in table1. The status of I0 & I1 determines the stepping motor power level, the power level pattern is shown in table2. Motor port is the protection pin. When it is at ‘LOW’ level, the power of the motor system will be closed. Power will be ON again until MOTOR pin is the pulse of ‘HIGH’ level. PHASE1 and PHASE2 determine the pattern of stepping motor drive circuit. For example, the sequence of PHASE1/PHASE2 in full step mode is 0/0 → 0/1 → 1/1 → 1/0.

Power Circuit

The U3 SI-8050JD converts 24Vdc to 5Vdc. And its limit current protest is 1.6A.

Parallel Interface Circuit

The Centronics interface supports one-way transmission SPP mode or ECP mode. The Parallel Interface Circuit is for use with the externally connected personal computer parallel interface through the Printer Cable. When PC’s strobe signal comes in, the printer responds the ‘busy status’ until it reads the data from parallel interface. Printer will respond the ‘error signal’ to PC when it is in error status.

Serial Interface Circuit

The RS-232 is asynchronous transfer. The RS-232 Circuit is for use with the externally connected personal computer and keyboard unit. JP15 connects to PC serial interface through the RS-232 cable. RxD is the data receive pin of MCU. CTS is the Clear To Send of MCU, which sends the signal from the external device. TxD is the data output pin of MCU. RTS is the Request To Send signal which MCU sends to the external device.

USB Circuit

This is standard USB 1.1.

Gap/Black Mark sensor

1. The Gap Sensor is penetrable sensor and with 64 levels.
2. Black Mark Sensor is reflecting sensor and with 64 levels.
3. The Gap Sensor activates when GAP& Black mark SW signal is HIGH; the Black Mark sensor activates when GAP& BM_SW signal is LOW.

Head Open Sensor

The Head Open Sensor is a penetrable sensor. The voltage is LOW when the Print Head opens; otherwise, it is HIGH.

Peel-off Sensor

The Peel-off Sensor signal voltage is HIGH when the paper is detected; otherwise, it is LOW.

Cutter Drive/ Protection Circuit

The RESET signal is “High” when the printer is turned on, The cutter is activated when The /CTEN signal is “low”. And the CTPHase signal controls the rotated direction. The U15B 74HC123 controls the breaking of the DC Motor of the cutter. The sensor of cutter sends the “Hi-Lo” signal to MCU through the CTSENS pin that detects the action of cutter.

4. REPLACING THE IMPORTANT PARTS

WARNING!

1. Turn off the power switch and disconnect the DC plug of the AC Adapter and the RS-232C cable before replacing any parts.
2. Follow all manual instructions. Failure to do so could create safety hazards such as fire or electrocution.

CAUTION!

1. To protect the connector pins or component from static discharge, do not touch them with bare hand.
2. Use electrostatic free form and the original carton for transportation.
3. Keep your work environment static free to avoid damage to the printer.
4. Do not remove any connectors from the printer within 10 sec. after unplugging the power cord.

NOTES:

1. Manual instructions must be followed when installing option kits or adding cables to avoid system failures and to insure proper performance and operation.
2. Failure to follow manual instructions or any unauthorized modifications, substitution or change to this product will void the limited product warranty.

■ Lubrication**CAUTION!**

1. Lubrication: During parts replacement
2. Kinds of oil: FLOIL G-488: 1kg can (part No.: 19454906001)

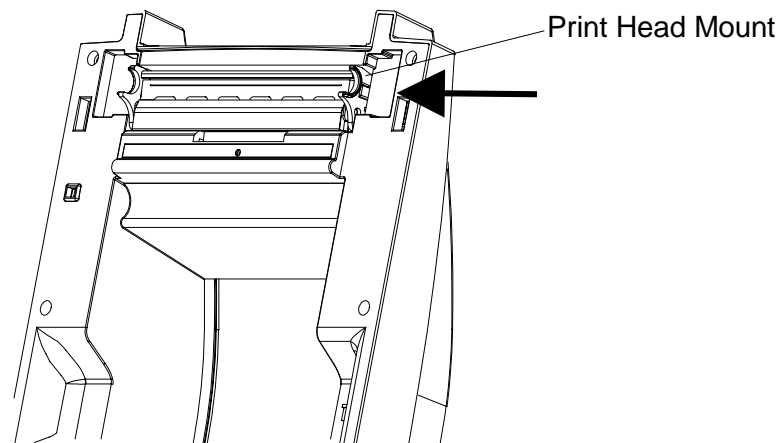
Any machine is generally in its best condition when delivered; therefore, it is necessary to try to keep this condition. Unexpected failure occurs due to lack of oil, debris, or dust. To keep its best condition, periodically clean the machine and apply proper kinds of oil to each part in which lubrication is needed. Although the frequency of lubrication varies according to how much the machine is used, at least it is necessary to lubricate before the machine becomes dry. It is also necessary to wipe off excessive oil as it collects dirt.

4.1 Replacing the Print Head Assembly

CAUTION!

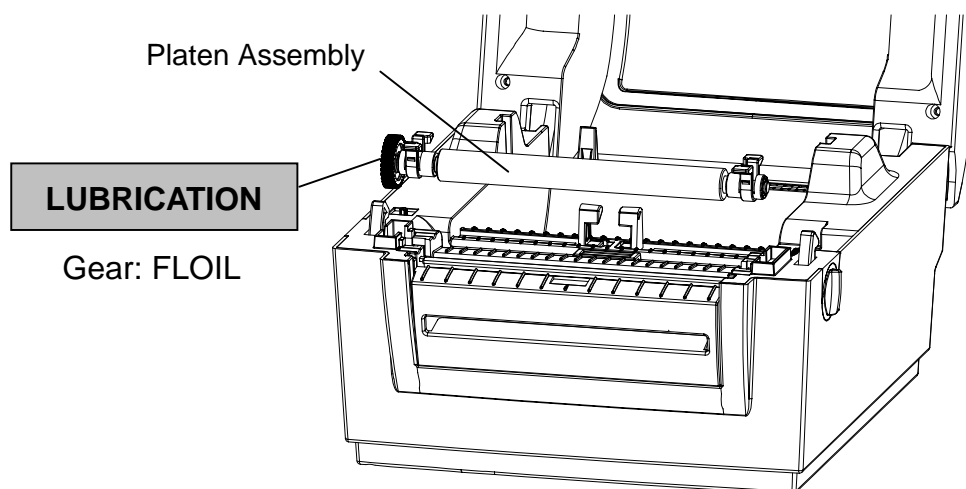
1. *NEVER touch the element when handling the Print Head.*
2. *NEVER touch the connector pins to avoid a breakdown of the Print Head by static electricity.*

1. Open the Top Cover.
2. Press one side of the Print Head Mount and push toward to the center to remove the Print Head Assembly.
3. Disconnect Print Head Harnesses.
4. Reassemble in the reverse procedures after replacing.
Refer to Section 5.4 and make a self test print to check for any print failures such as missing dots.



4.2 Replacing the Platen Assembly

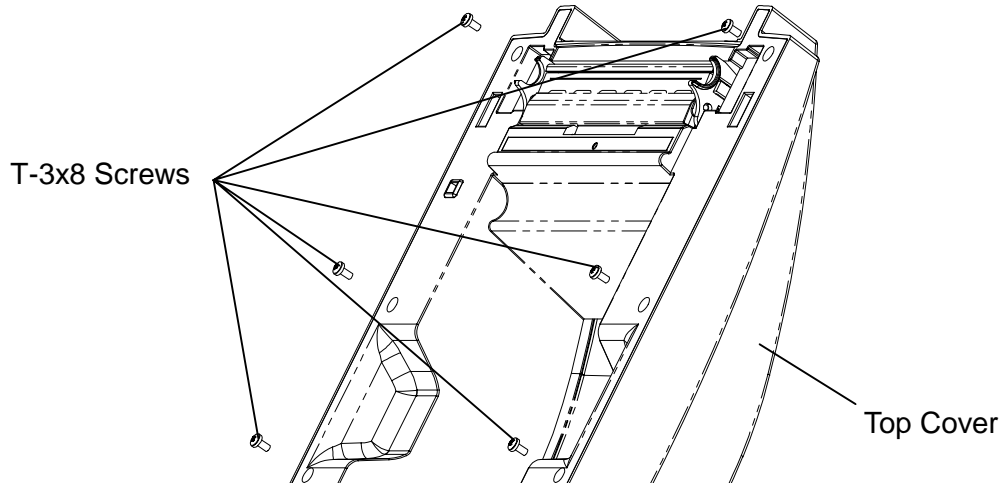
1. Open the Top Cover.
2. Squeeze the two sides of Platen Assembly and remove Platen Assembly.



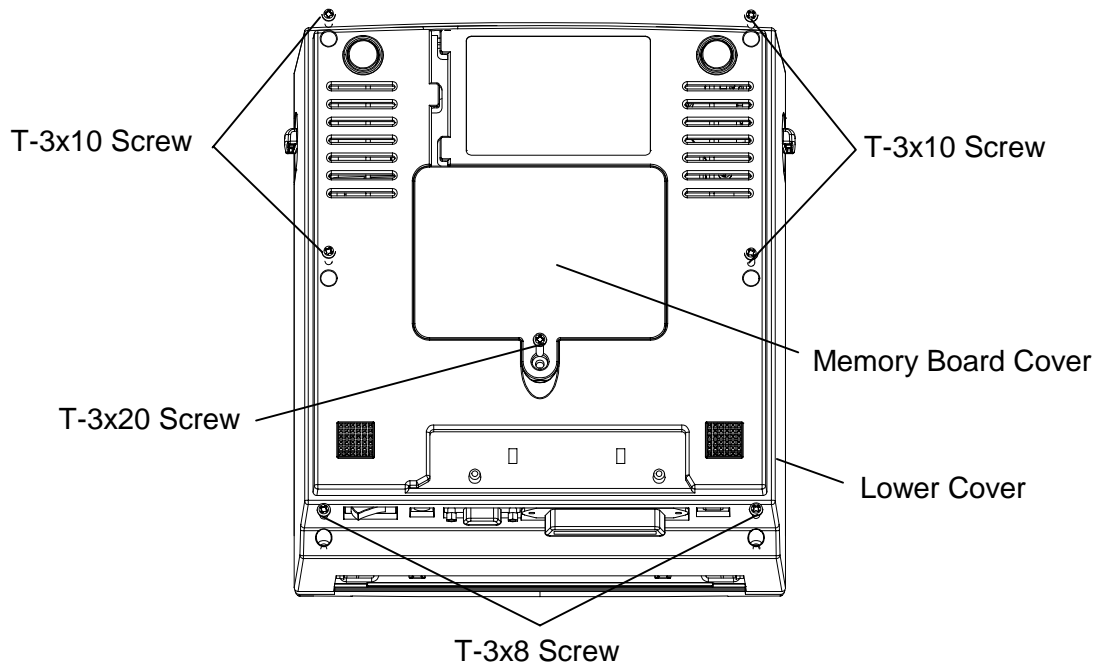
3. Reassemble in the reverse procedures. While reassembling, be sure to apply FLOIL to the gear.

4.3 Replacing the Top Cover, Lower Cover, and Main PC Board

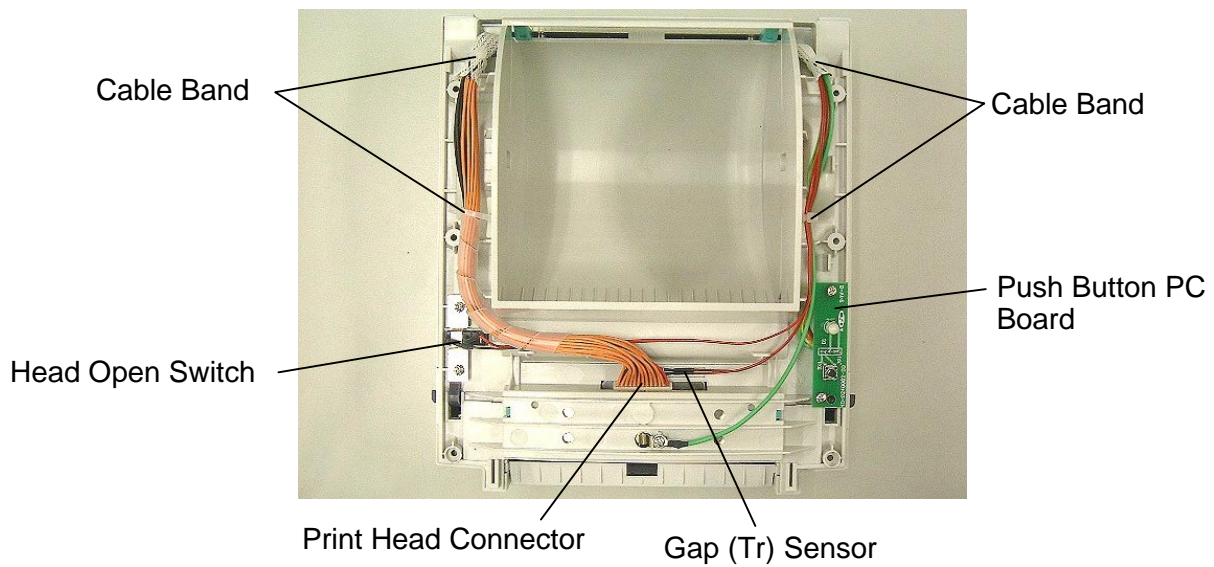
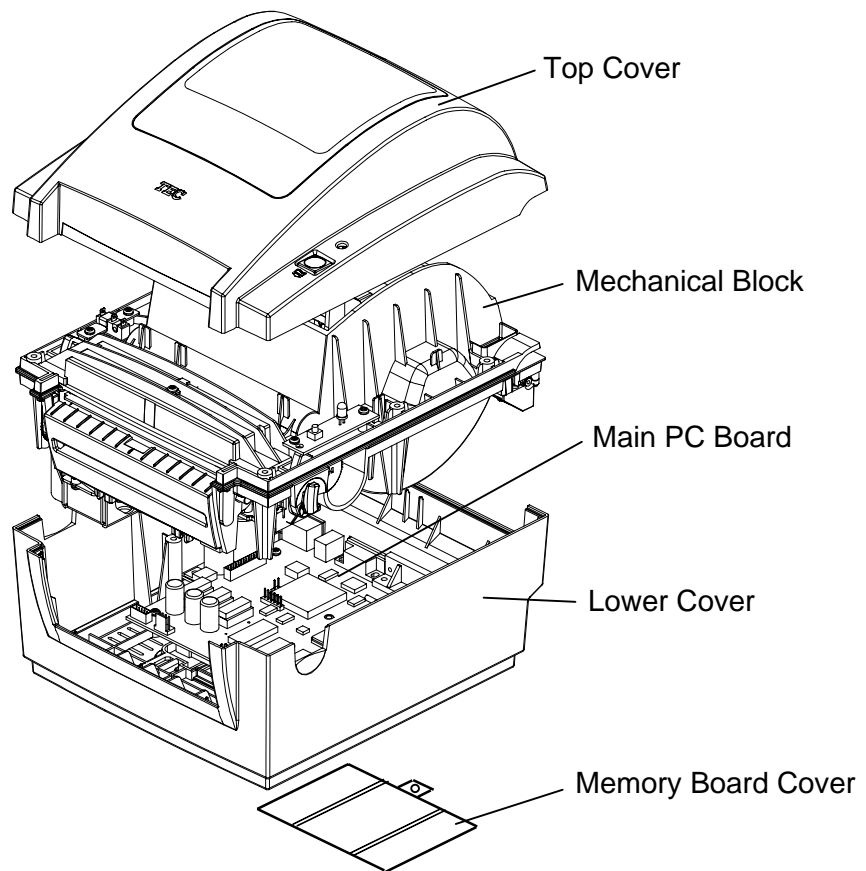
1. Open the Top cover.
2. Remove the 6 screws from the Top Cover.

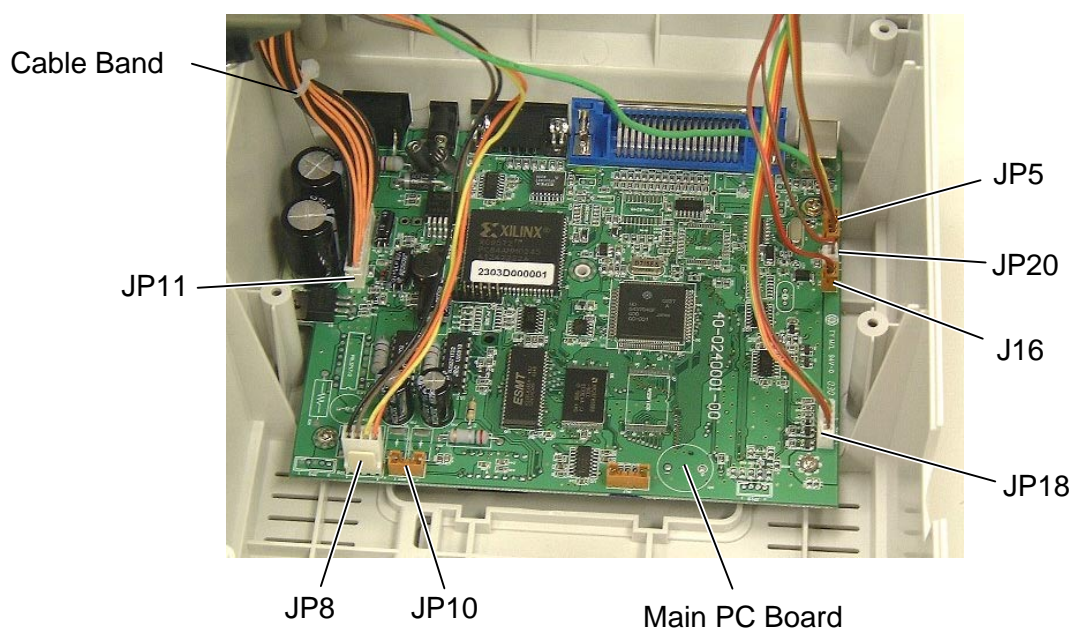


3. Remove the 7 screws from the Lower Cover and Memory Board Cover.



4. Disconnect the all cables from the Main PC Board.
5. Remove the Top Cover, Lower Cover, and Memory Board Cover.

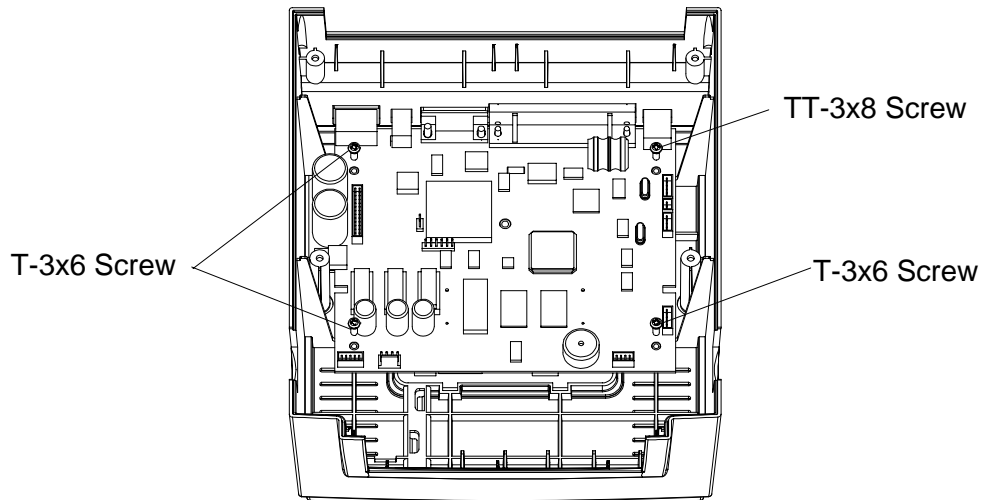


**NOTE:**

Refer to the following table and above picture when re-connecting the cables to the Main PC Board. Be careful that there are some cables whose connectors have the same number of pins.

Connector No.	Number of pins	Housing color	Connected to
JP3	6	Black	(Not used.)
JP5	5	Brown	LED & Button
JP6	50	Black	Memory PC Board
JP8	4	White	Stepping Motor
JP10	4	Brown	Cutter (GC10 model only)
JP11	26	White	Print Head
J16	2	Brown	Case/Head Open Switch
JP17	5	Brown	(Not used.)
JP18	5	White	Gap (LED)/Black mark sensor
JP20	2	White	Gap sensor (Tr)

6. Remove the 4 screws from the Main PC Board.



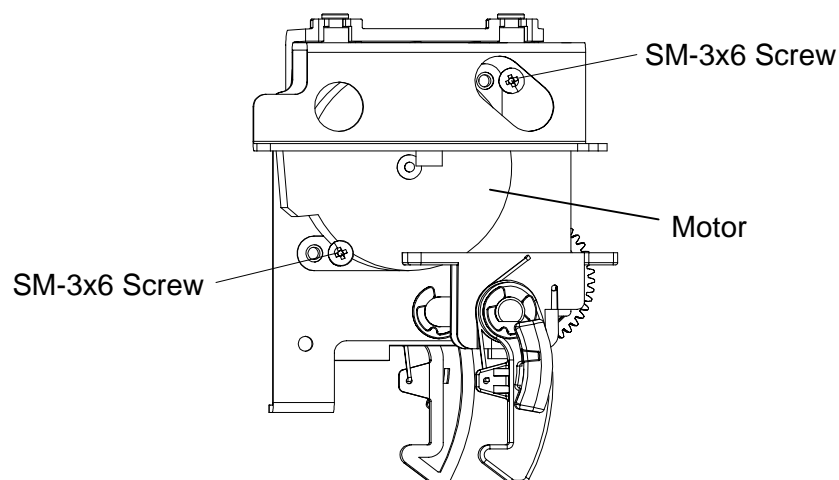
7. Replace Main PC Board.
8. Reassemble in the reverse procedures.
Refer to Section 2.7.1, Media Sensor Calibration of the Owner's Manual and make a sensor adjustment.

NOTES:

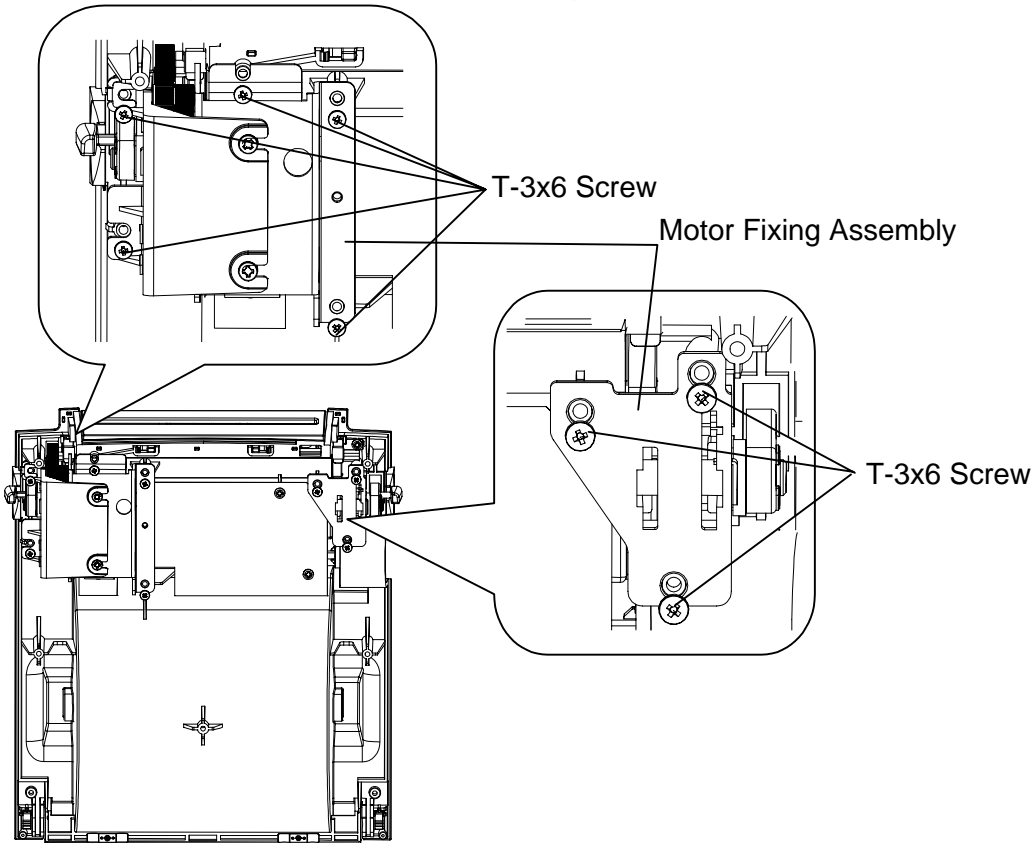
1. As the cables are long, be careful not to pinch them by the covers.
2. To prevent the cables from being pinched by the covers, be sure to fix them to the specified positions with cable bands.

4.4 Replacing the Motor Fixing Frame Assembly and Motor

1. Remove the 7 screws to detach the Lower Cover. (Refer to Section 4.3.)
2. Disconnect the harness from JP8 connector on the Main PC Board.
3. Loosen the 2 fixing screws and remove Motor.

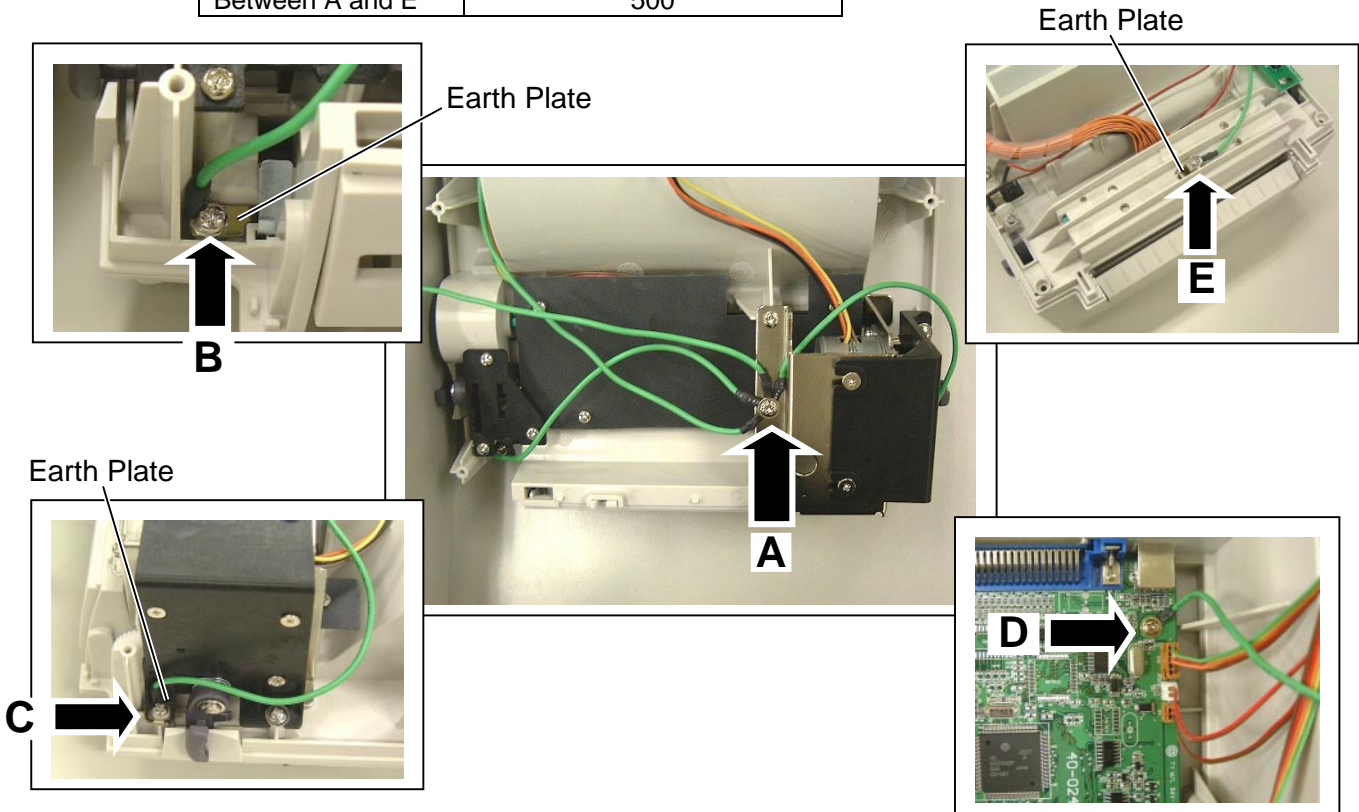


4. Loosen 8 fixing screws of the Motor Fixing Frame Assembly.

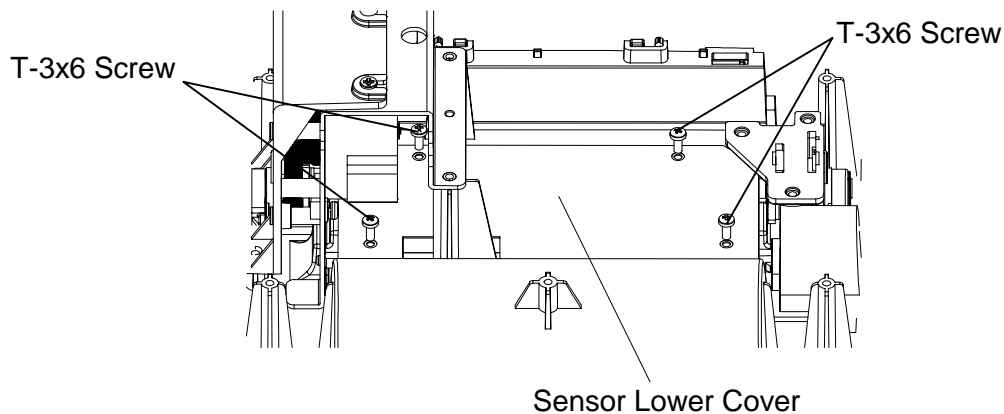


NOTE: Ground wires are attached to the following locations with the screws.

Section	Lead wire length (mm)
Between A and D	230
Between A and B	150
Between A and C	150
Between A and E	500

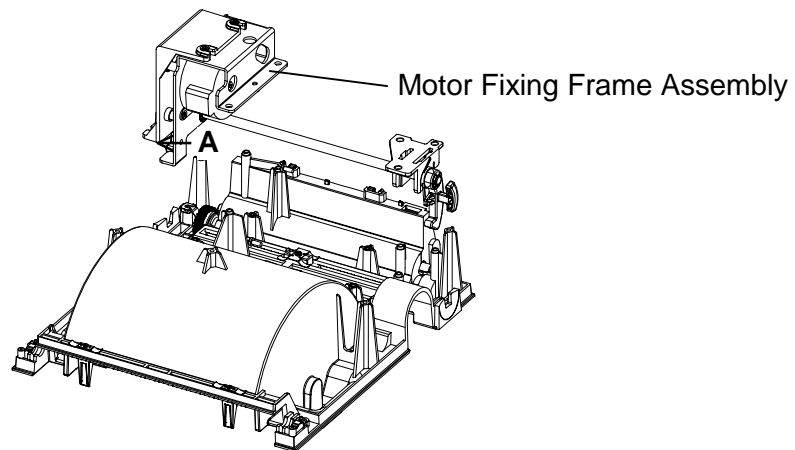


5. Remove the 4 screws to detach the Sensor Lower Cover.



6. Remove the Motor Fixing Frame Assembly.

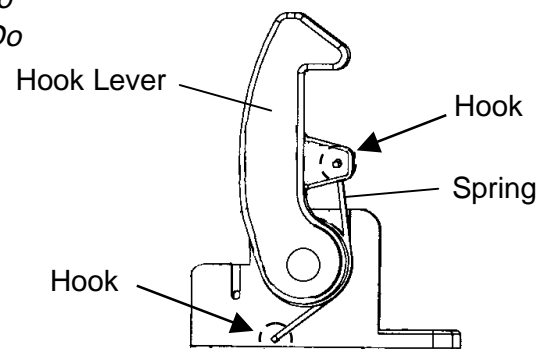
NOTE: When reassembling the Motor Fixing Frame Assembly, refer to Section 4.5 and insert the shaft of the Label Guide Adjustment into Hole A.



7. Reassemble in the reverse procedures after replacing.

NOTES:

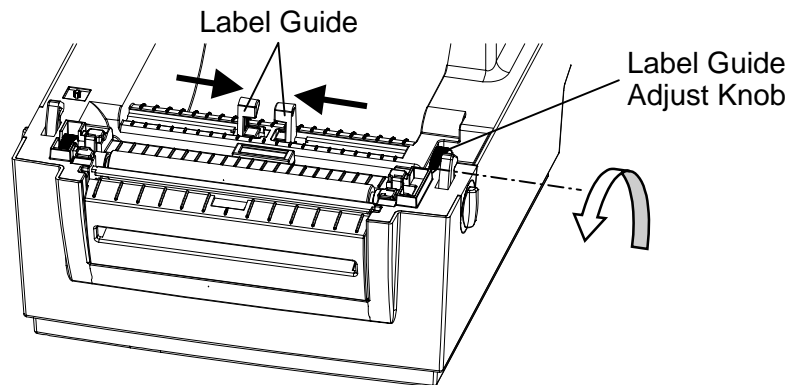
1. Be sure to hook the both ends of the spring into the pin holes as shown in the figure below. Do this to both springs.



2. Make sure that the Motor rotates smoothly by turning it manually.
3. Apply FLOIL to the all gears of the Motor Fixing Frame Assembly.

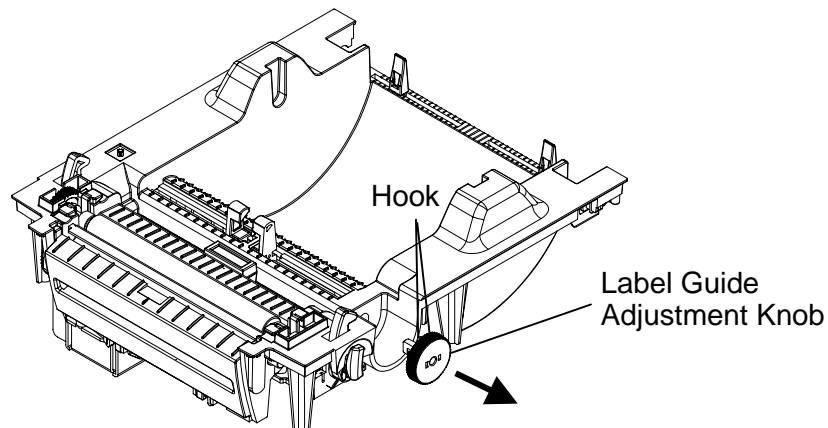
4.5 Replacing the Label Guide Adjustment Assembly

1. Rotate the Label Guide Adjust Knob to move the Label Guides to the center.

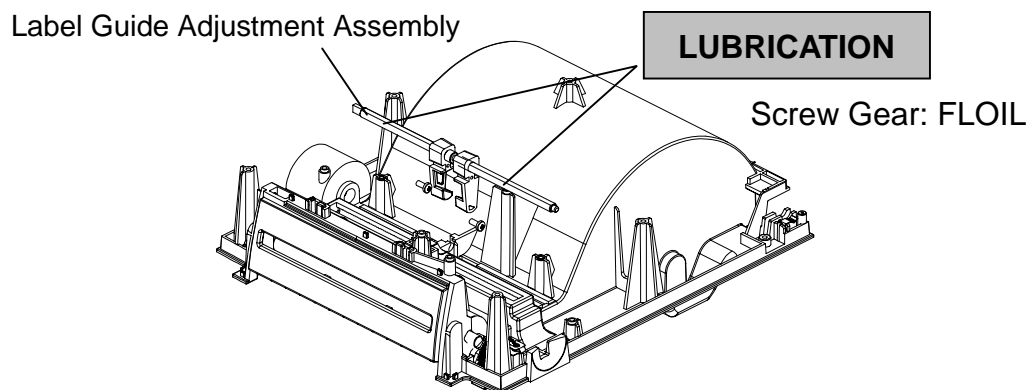


2. Remove the 7 screws to detach the Lower Cover. (Refer to Section 4.3.)
3. Loosen 4 screws and remove the Sensor Lower Cover. (Refer to Section 4.4.)
4. Remove Label Guide Adjustment Knob.

NOTE: If it is hard to remove the Label Guide Adjustment Knob, release the two hooks first.
Be careful not to damage the hooks.



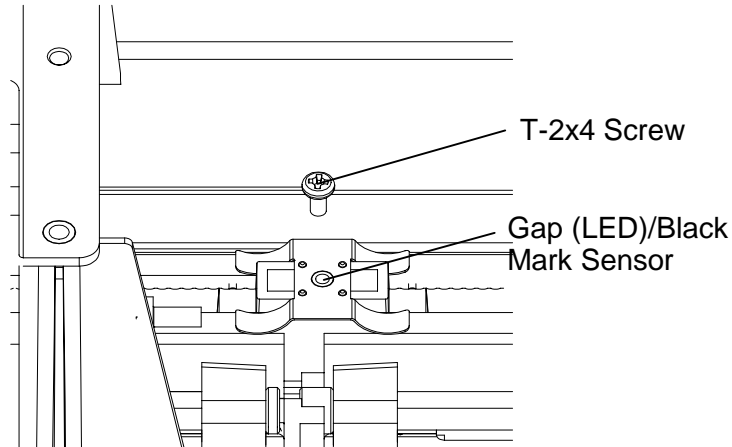
5. Remove Label Guide Adjustment Assembly.



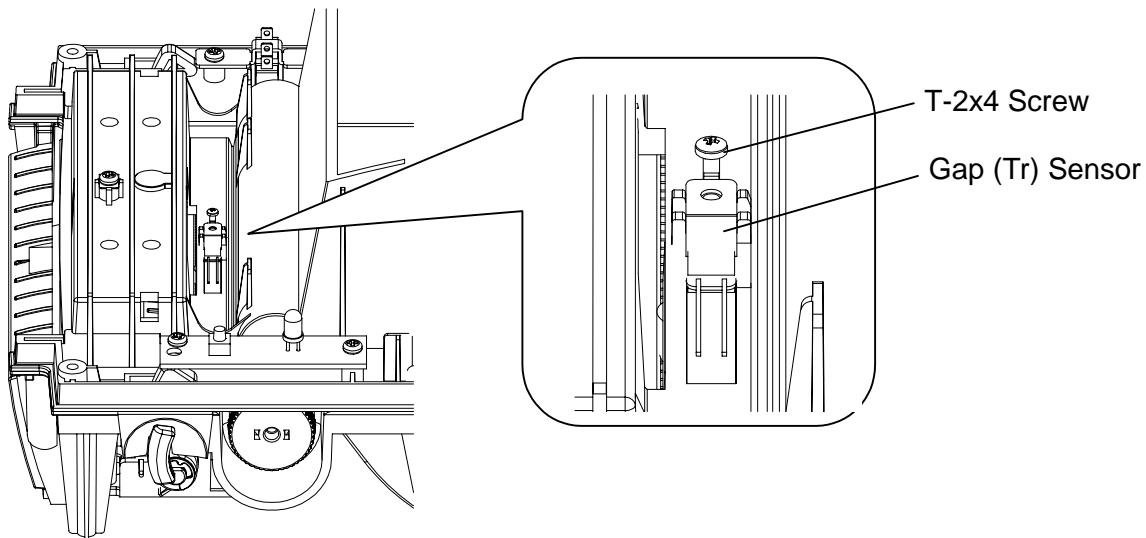
6. Reassemble in the reverse procedures after replacing. While reassembling, be sure to apply FLOIL to the Screw Gear.

4.6 Replacing the Gap/Black Mark Sensor Assembly

1. Remove the 7 screws to detach the Lower Cover. (Refer to Section 4.3.)
2. Remove the 4 screws to detach the Sensor Lower Cover. (Refer to Section 4.4.)
3. Disconnect the Gap (LED)/Black Mark Sensor harness from JP18 on the Main PC Board.
4. Loosen the fixing screw to remove the Gap (LED)/Black Mark Sensor Assembly.



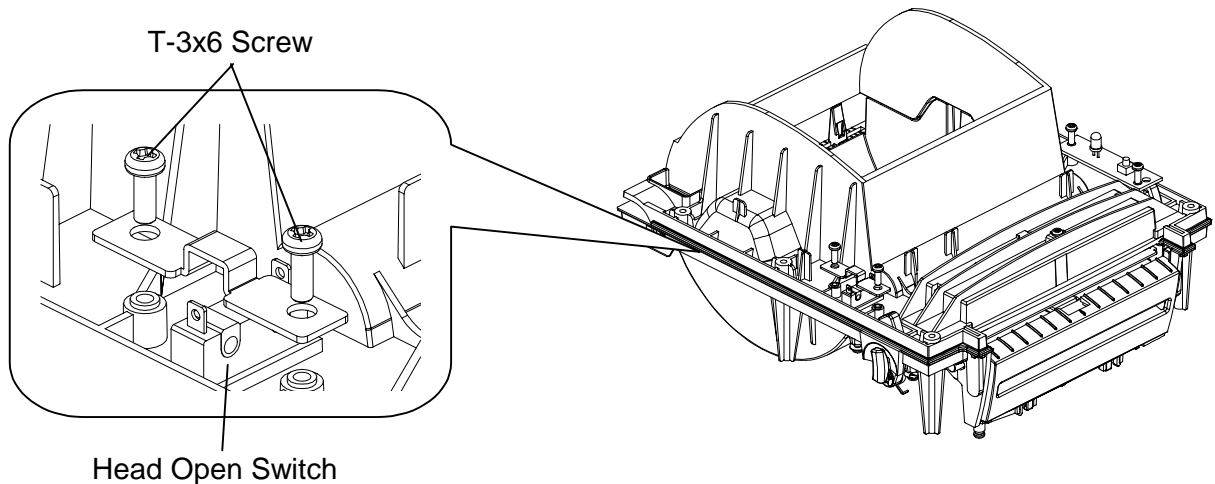
5. Disconnect the print head cable from the print head.
6. Disconnect the Gap (Tr) Sensor harness from JP20 on the Main PC Board.
Loosen the fixing screw to remove the Gap (Tr) Sensor Assembly.



7. Reassemble in the reverse procedures after replacing.
Refer to Section 2.7.1, Media Sensor Calibration of the Owner's Manual and make a sensor adjustment.

4.7 Replacing the Head Open Switch

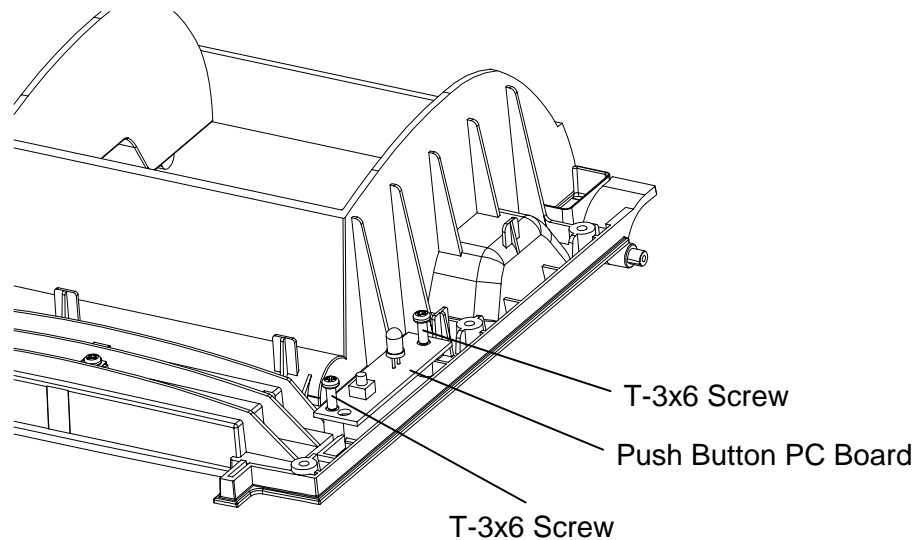
1. Remove the Top Cover and Lower Cover. (Refer to Section 4.3.)
2. Disconnect the Head Open Switch harness from JP16 on the Main PC Board.
3. Loosen the fixing screws to remove the Head Open Switch.



4. Reassemble in the reverse procedures after replacing.
After attaching the Head Open Switch, set the media on the printer, turn on the power, and confirm that the Indicator Lamp changes from the illumination of green to the blinking of red when the Top Cover is opened.

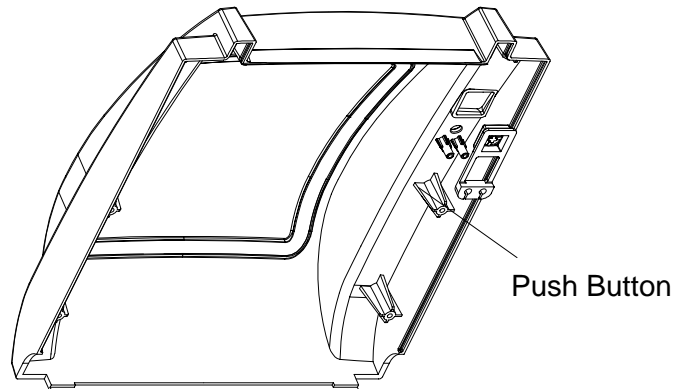
4.8 Replacing the Push Button and Push Button PC Board

1. Remove the Top Cover and Lower Cover. (Refer to Section 4.3.)
2. Disconnect the Push Button PC board harness from JP5 on the Main PC Board.
3. Loosen the fixing screws to remove the Push Button PC board.



4. Remove the Push Button.

NOTE: Do not remove the Push Button for any purposes except for replacement. If the Push Button is removed, be sure to fully insert it when reassembling.



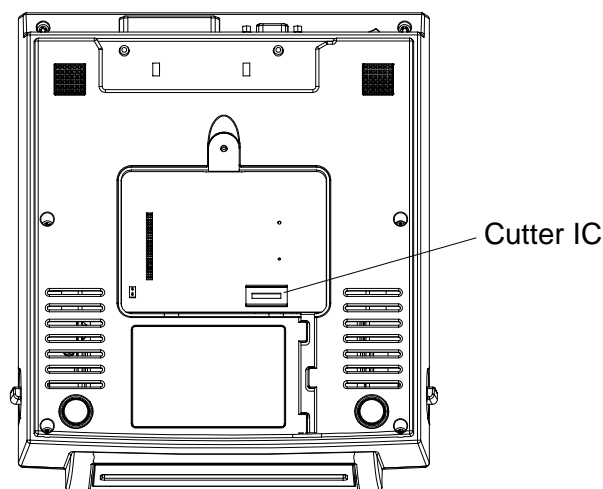
5. Reassemble in the reverse procedures after replacing.
After attaching the Push Button PC Board, set the media on the printer, turn on the power, and confirm that the media is fed when the Push Button is pressed.

4.9 Installing the Optional Cutter

WARNING!

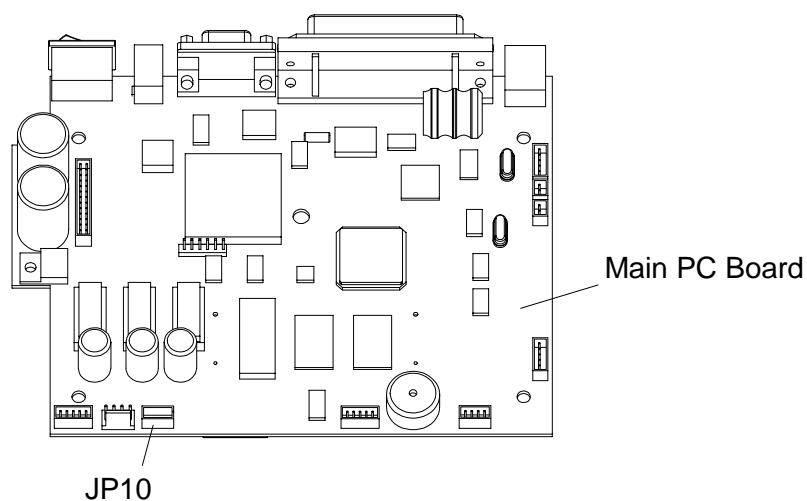
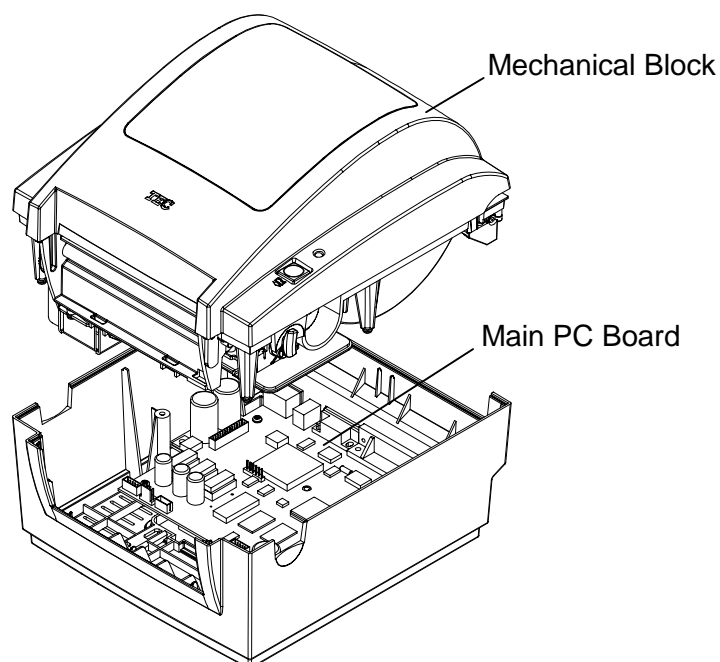
1. Be sure to turn OFF the power before removing the Cutter Cover.
2. Care must be taken not to injure your fingers by the cutter blade.

1. Turn off the printer power.
2. Remove 7 screws to detach the Lower Cover. (Refer to Section 4.3.)
3. Insert Cutter IC (U14) on the Main PC Board.

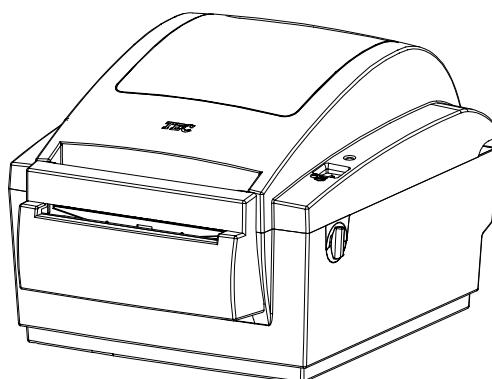


4. Remove the Front Cover.

5. While lifting and holding the Mechanical Block, connect the harness of the Cutter Assembly to JP10 on the Main PC Board.

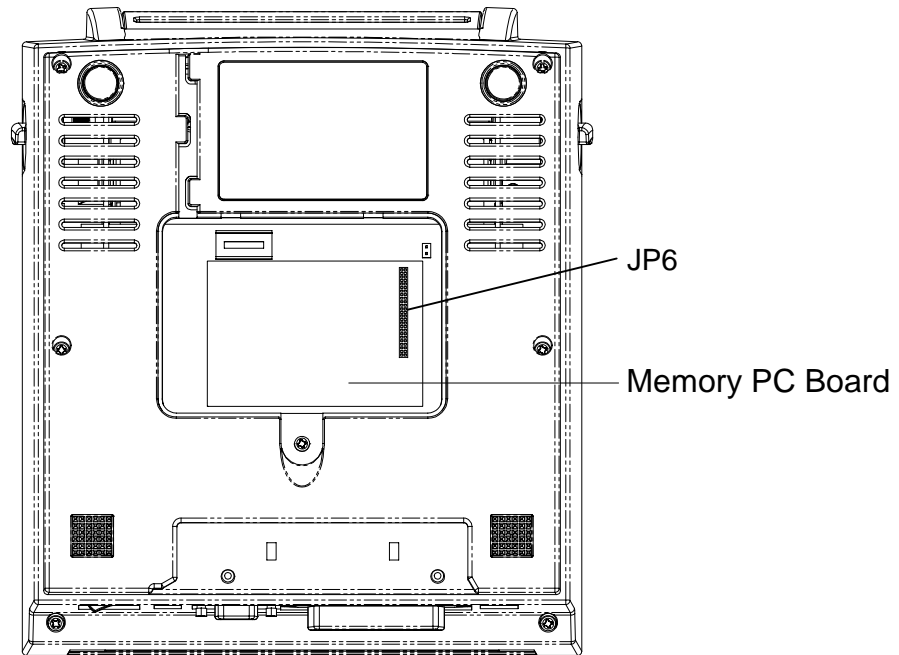


6. Attach the Cutter Assembly to the Lower Cover.
7. Re-attach the Mechanical Block in position.



4.10 Installing the Optional Memory PC Board

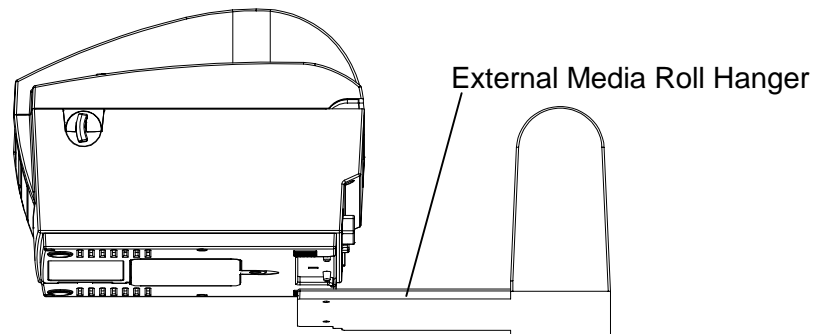
1. Turn off the printer power.
2. Remove the fixing screw and open the Memory Board Cover. (Refer to Section 4.3.)
3. Connect the Memory PC Board to JP6 on the Main PC Board.



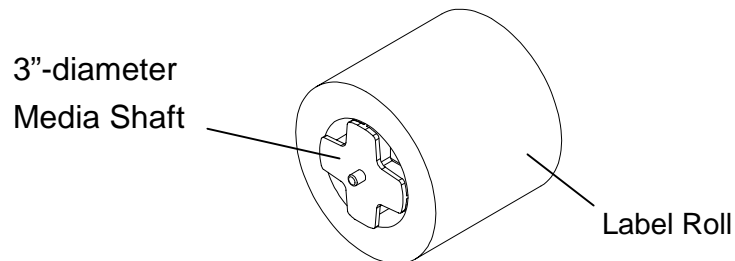
4. Re-attach the Memory Board Cover.
5. After connecting the Memory PC Board, perform a self print test to confirm that the memory capacity has increased correctly.

4.11 Setting Up the Optional External Media Roll Hanger

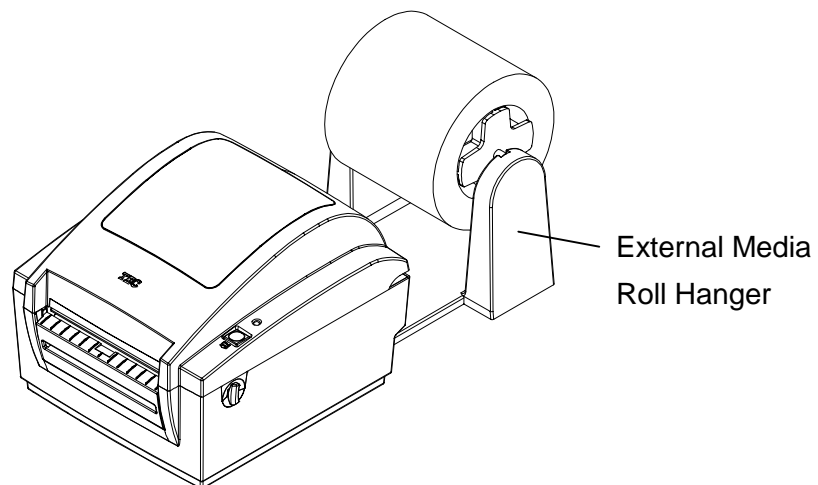
1. Fix the External Media Roll Hanger on the rear of printer.



2. Put the label roll onto the 3"-diameter Media Shaft.



3. Place the Media Shaft onto the slots of the External Media Roll Hanger.



4. Pull the label forward through rear paper inlet, label guide to paper outlet.

5. POWER ON UTILITIES

There are three power-on utilities to set up and test B-SV4D hardware. These utilities are activated by pressing FEED button and turning on the printer power simultaneously. The utilities are listed as below:

1. Printer BIOS Update
2. Printer Initialization
3. Gap/Black Mark Sensor Calibration
4. Printer Self-Test & Dump Mode

5.1 Printer BIOS Update

If printer BIOS update is required, please follow the steps as below.

1. Turn off printer power.
2. Press FEED button while turning on the printer power. The LED will be indicated in orange color first then will change to green and then red color.
3. Release FEED button and press it again immediately. The LED will change to orange color and blinking then printer is in BIOS update mode.
4. Copy the BIOS FILE to printer parallel port by the following command is MS-DOS prompt mode.

```
C:\>COPY BSV4D100.NEW /B LPT1
```

```
C:\>
```

NOTE: Underlined part differs depending on the ROM version.

5. The LED will change to green color and blink at one second interval.
When BIOS update is completed, printer will reset automatically.

5.2 Printer Initialization

Printer Initialization will restore printer settings to defaults.

Please follow the steps below to initiate the printer settings.

1. Turn off printer power.
2. Press FEED button while turning on the printer power. The LED will be indicated in orange color first then will change to green and then red color.
3. Do not release the button until the LED is blinking in turn with orange and green color.
4. After initialization, printer will reset automatically.

5.3 Gap/Black Mark Sensor Calibration

Sensor selection must be specified before calibrate the gap sensor. Please refer to section 6, GAP/BLACK MARK/NON SENSOR SELECTION.

Please follow the steps below to calibrate the sensor:

1. Turn off the printer power and install blank labels (without preprinted logo or characters) on printer.
2. Press FEED button while turning on the printer power. The LED will be indicated in orange color first then will change to green and then red color.
3. Do not release the FEED button until the LED is blinking in turn with orange and red color. Printer will calibrate the sensor.

5.4 Printer Self-Test and Dump Mode


Please follow the steps below to print out printer information and then enter the dump mode.

1. Turn off the printer power and install blank labels (without preprinted logo or characters) on printer.
2. Press FEED button while turning on the printer power. The LED will be indicated in orange color first then will change to green and then red color.
3. Do not release the FEED button until the green LED is lit on without any blinking then printer will print printer information then entering dump mode.
4. To resume the printer for normal printing, please turn off/on the printer power.

In self-test, a check pattern is used to check the performance of the thermal print head. Following the check pattern, the printer prints internal settings as listed below:

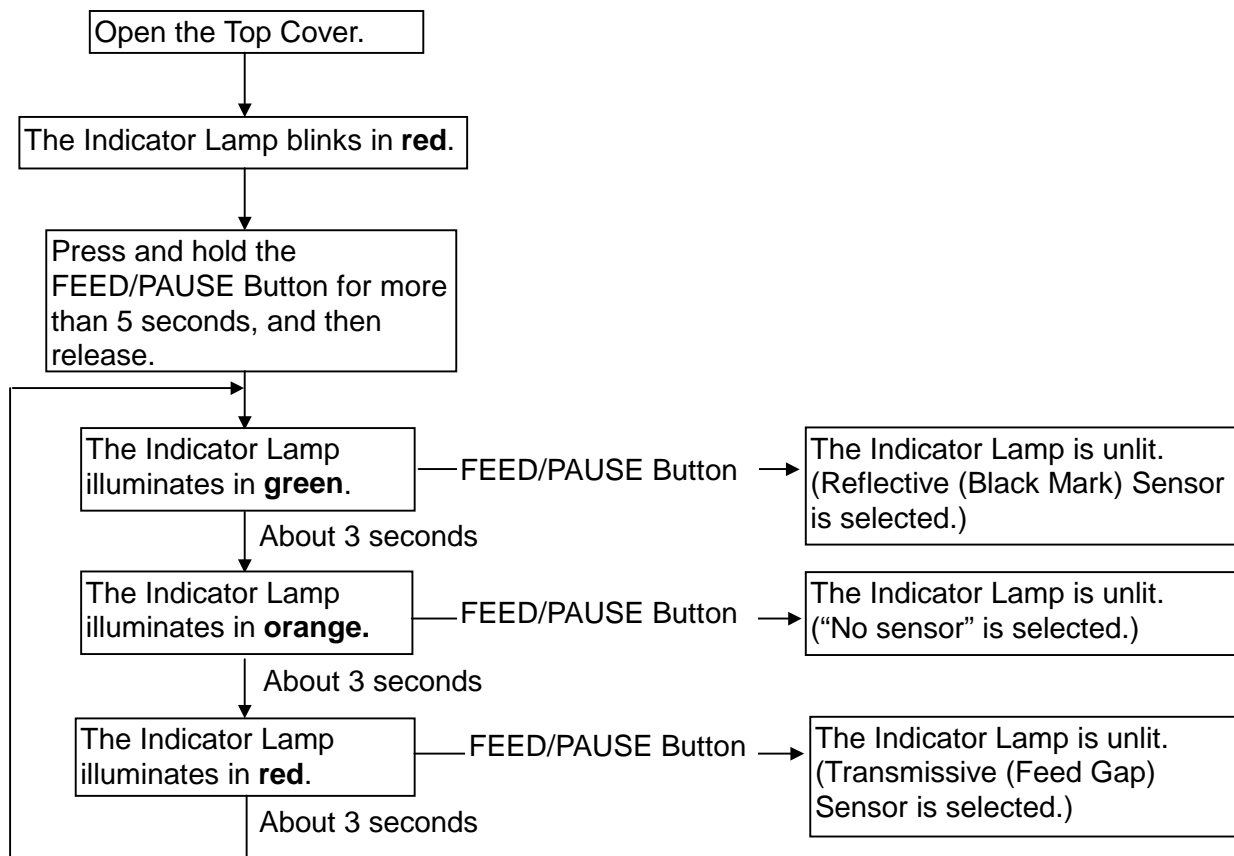
1. Printer model and firmware version
2. Check sum
3. Serial interface setting
4. Code page setting
5. Country code setting
6. Print density setting
7. Feed Adjust
8. Cut Position Adjust
9. Backfeed Adjust
10. X-coordinate
11. Information*
12. Total Feed

*: Information is printed only when some information is stored in the flash ROM.

PRINTER INFO.	
PROGRAM VERSION	VX.XX XXXX
TONE ADJUST	+XX
FEED ADJUST	+XX.Xmm
CUT POSITION ADJUST	+XX.Xmm
BACKFEED ADJUST	+XX.Xmm
PARAMETER	[PC-850][0]
	[9600][8][1][NONE][0]
	[ON][AUTO][FEED][B0]
X-COORDINATE ADJUST	+XX.Xmm
SENSOR	TRANSMISSIVE [17]
MEMORY	[192KB][XXXKB]
TTF AREA	[XXXKB][XXXKB]
EXT CHAR AREA	[XXXKB][XXXKB]
BASIC AREA	[XXXKB][XXXKB]
PC SAVE AREA	[XXXKB][XXXKB]
INFORMATION	XXXXXXXXXXXXXXXXXXXX
TOTAL FEED	X.XXXKm
	

6. GAP/BLACK MARK/NON SENSOR SELECTION

Gap sensor, black mark sensor and no sensor mode are available on the B-SV4D. To select the sensor for your media, please turn on power to let printer to enter standby mode.



7. TROUBLESHOOTING

	Problems	Solutions
1	Poor printing quality.	<ul style="list-style-type: none">● Clean the Print Head.● Adjust the print density setting.
2	Power indicator light/on-line indicator does not illuminate.	<ul style="list-style-type: none">● Check the connection of Serial Interface Cable.● Check if the Top Cover is close.
3	Error indicator remains illuminated.	<ul style="list-style-type: none">● Out of paper or paper jam.● Check if the Gap Sensor is in the correct detecting mode.● Press the FEED button. The error message will be printed out on the print media or sent out.
4	Printer does not work.	<ul style="list-style-type: none">● Check if the command is correct.● Check if the RS-232 baud rate is correct.● Using Label View or Nice Label to print, make sure the driver is for the correct model.● Check if the Printer Manager contains other data.● Restart the printer.
5	Wrong printing position or skip.	<ul style="list-style-type: none">● Check the label dimension settings.● Check the label gap setting● Detect gap again.● Check if there is any paper stuck on the gap sensor.

8. PRINTER CLEANING

The printer should be cleaned regularly to retain high quality and optimum performance.

8.1 Print Head Cleaning

1. Switch off and unplug the printer.
2. Open the printer Top Cover.
3. Remove the label media. (If loaded)
4. Using a swab soaked in the dilute alcohol, wipe along the Print Head carefully.
5. Do not close the Print Head until the alcohol volatilizing.
6. Close the Top Cover.

8.2 Cover Cleaning

CAUTION! <i>Do not use harsh or abrasive cloth and solvent.</i>
--

1. Switch off and unplug the printer.
2. Wipe the Cover with a dry soft cloth. Wipe off dirt with a soft cloth slightly moistened with water.

8.3 Internal Parts Cleaning

1. Switch off and unplug the printer.
2. Open the printer Top Cover.
3. Remove the label media (If loaded).
4. Using a soft cloth soaked in the alcohol or mild detergent to wipe the internal parts, such as Platen, sensor, etc.
5. Remove the Rubber Roller by squeezing two sides of the Rubber Roller.
6. Rubber Roller should be clean by cloth soaked in water.
7. Install Rubber Roller and label media.
8. Close the Top Cover.

9. NETWORK SPECIFICATION

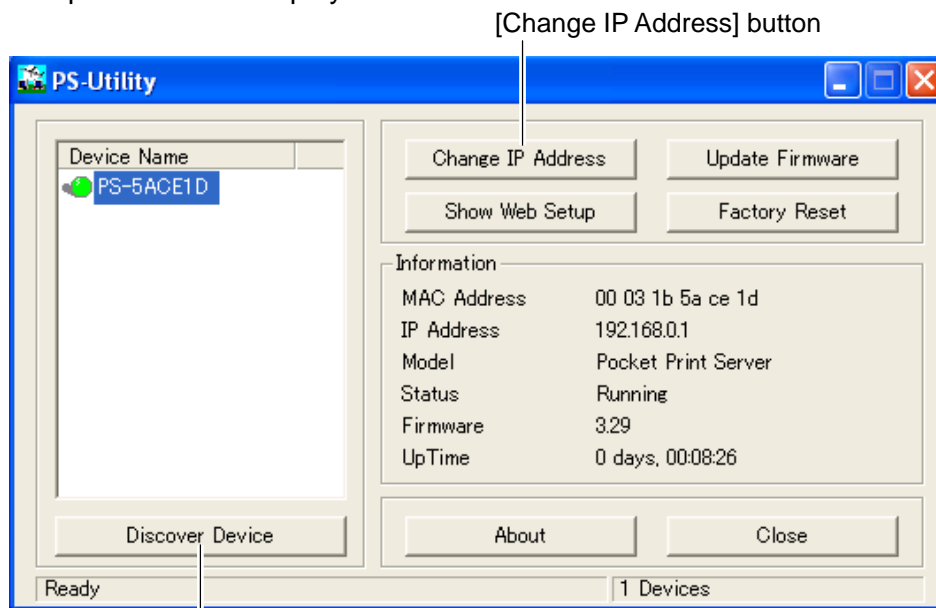
9.1 PRINT SERVER SETUP

1. Start the PS-Utility.

Note: Please download the PS setup utility which is required to configure the print server settings for the B-SV4D-GS12-QM-R from Barcode Knowledge Pot at the following URL.

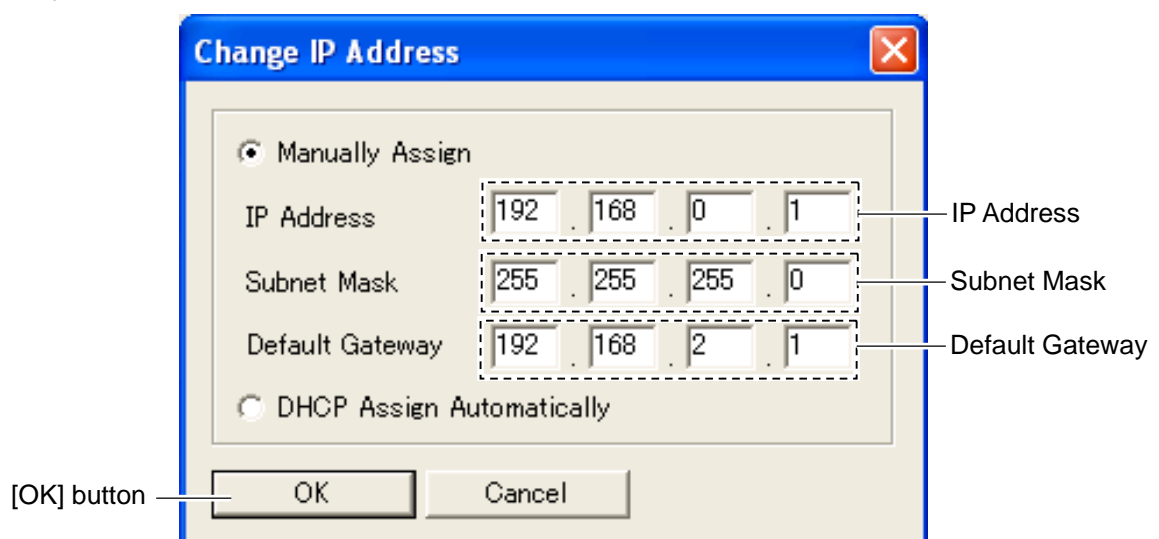
<http://barcode.toshibatec.co.jp/Ris/products/barcode/support/en/index.php>

2. Connect the printer to a PC with a LAN cable (cross cable).
3. Click on the [Discover Device] button.
4. A searched print server is displayed on the Device Name list box.



[Discover Device] button

5. When the [Change IP Address] button is clicked, the following screen will appear. Click on the Manually Assign radio button, and set the IP Address, Subnet Mask, and Default Gateway. Then, click on the [OK] button.

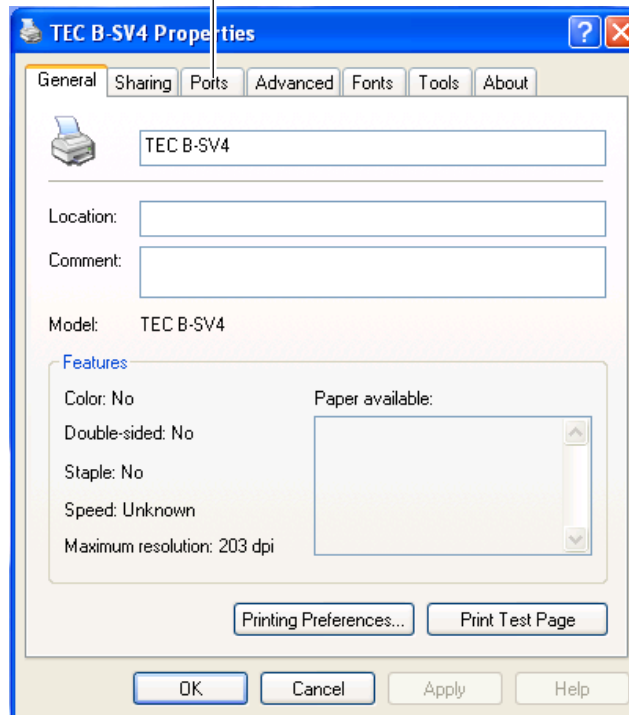


Now that, the LAN settings on the printer is enabled. The current LAN settings can be confirmed by a diag. test print.

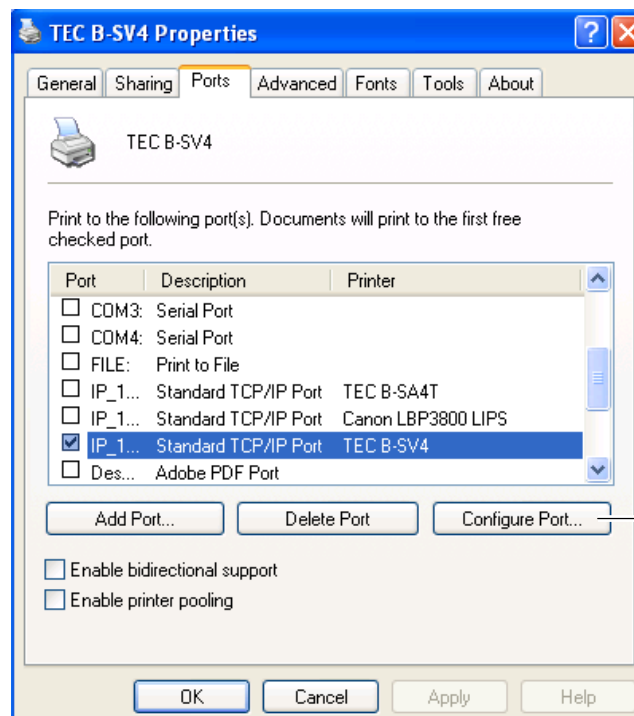
9.2 PRINT DRIVER PORT SETTING

1. Click on the Windows Start button, choose the Settings, then Printers and Faxes.
2. Right click on the TEC B-SV4 icon, and click on the Properties to open the Properties screen.
3. Click on the Ports tab.

Ports Tab

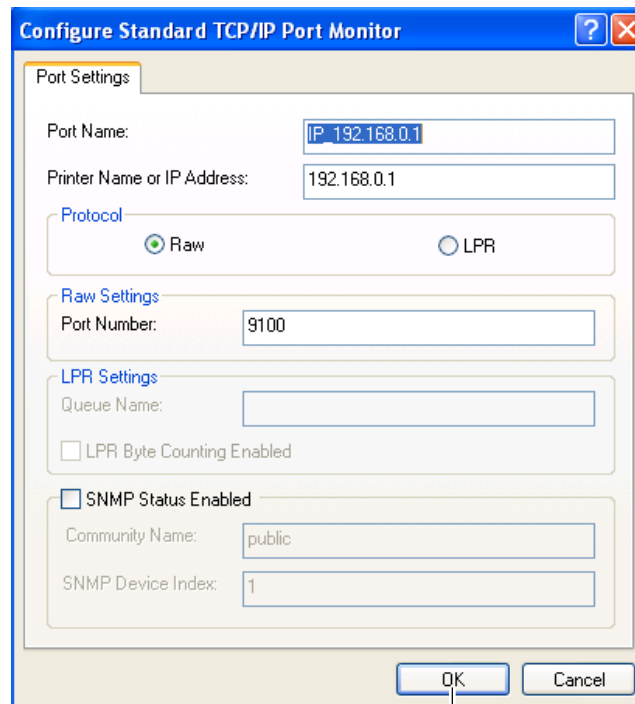


4. Remove the check from the Enable bidirectional support check box. Click on the [Configure Port] button.



[Configure Port] button

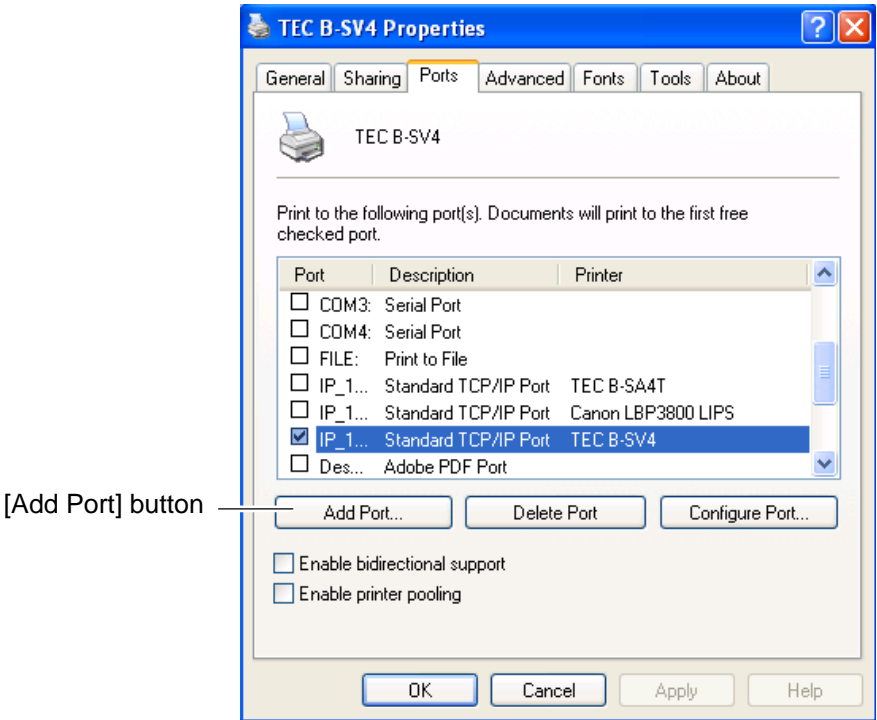
5. Click on the Raw radio button for the Protocol, and enter “9100” (default) for the Port Number. Click on the [OK] button.



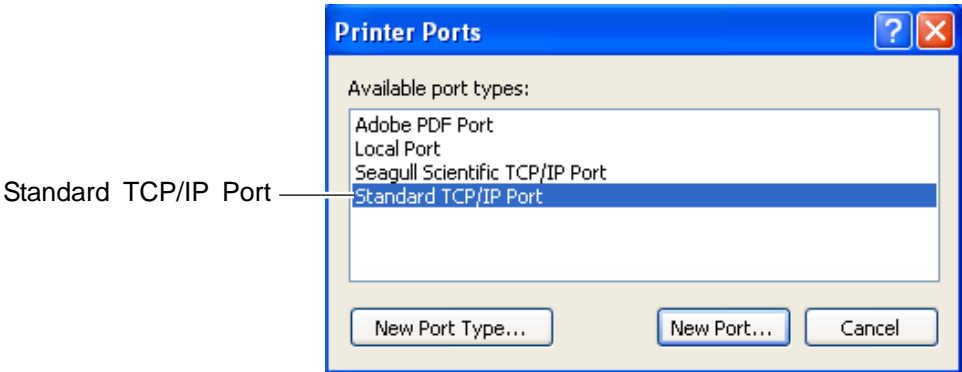
[OK] button

9.3 ADDITION OF A TCP/IP PORT

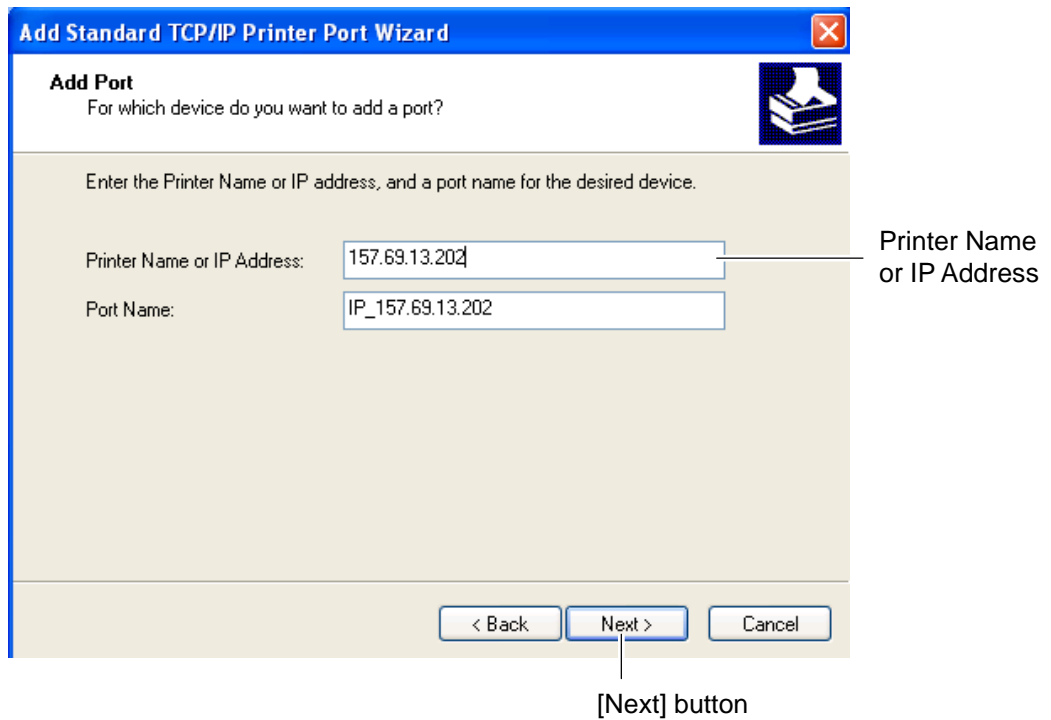
1. Click on the [Add Port] button.



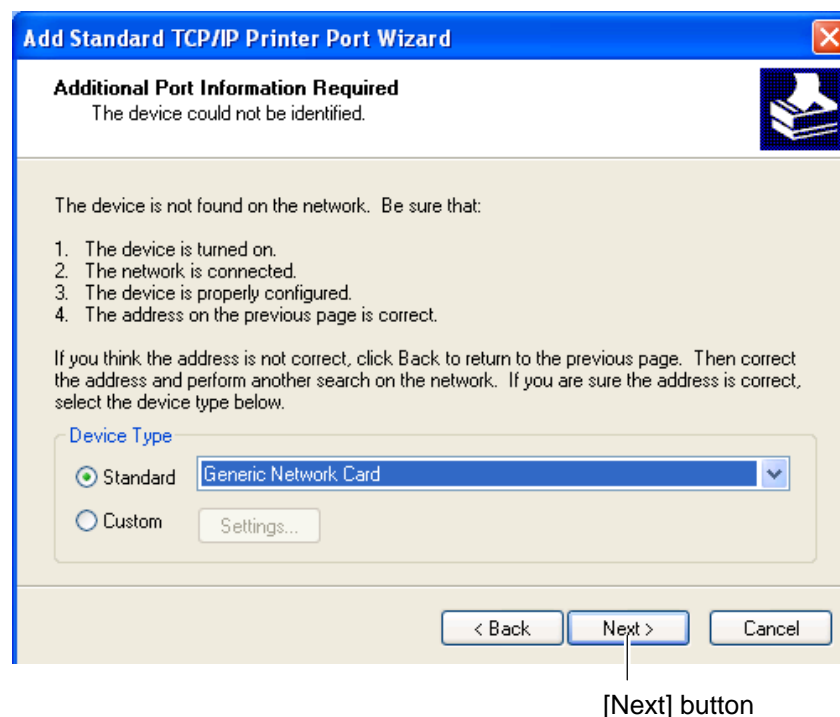
2. Double-click on the Standard TCP/IP Port.



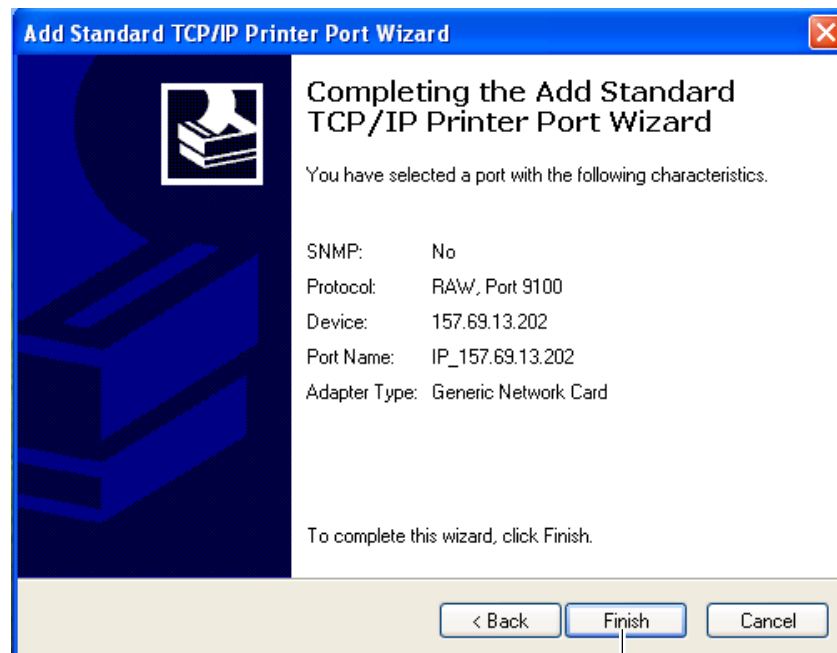
3. Enter the printer IP address for the Printer Name or IP Address, then click on the [Next] button.



4. When the following screen appears, click on the [Next] button.



5. Click on the [Finish] button. An addition of a TCP/IP printer port is completed.



[Finish] button

